

MARCH 5, 1936

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2—THE IRON AGE, March 5, 1936

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THE IRON AGE

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MARCH 5, 1936

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Do You Enjoy Having Your Shins Kicked?

WHEN you were a schoolboy, you may have encountered a bully. Most of us did. He was a strong, overgrown chap who delighted in tormenting smaller and weaker fellows. If you belonged to a "gang," he would let you alone or seek your friendship. If you were a "minority," he would kick your shins. Psychologists say that the bully is merely satisfying a superiority complex. Be that as it may, he is not loved by his victims.

Perhaps there is a mental holdover from childhood memories of such punishment that answers the question "why is business antagonistic to the New Deal?" Our Government is so much bigger and stronger than even the biggest of private enterprises that when it selects us for kicks and pinches, many of us feel that we are being bullied. Especially so when we see the big fellow dodging coming to grips with the powerful Townsend, Coughlin and other "gangs" which number their followings in millions.

Perhaps this is the reason for the coming of the Liberty League, the Crusaders and other defensive business groups whose formation has caused so much remonstrance from the Administration. It isn't sporting for the little fellow to put on shin guards.

E. P. Dillman, vice-president of the Wyatt Metal Boiler Works, of Dallas, ably marshals the reasons why business fears the New Deal and is antagonistic to it:

"Business recalls many things the Administration has undertaken that have quite adversely affected it. Specifically, it has not forgotten the action of repudiation of the gold contracts; the debasement of the currency; the carefully prepared propaganda with respect to class hatred, followed by NRA with its under-swell of boycott and its obvious effort to capture the labor vote through unionization. Also the arbitrary action regarding airmail and the consequent tragic waste of life. And yet to business, even these grave and vital menaces bow to the fear of a self-perpetuating dynasty through the building up of a tremendous machine at the expense of business which must supply much of the payroll. It is the future that business fears even more than the present. Faced with present tax burdens seriously affecting the building up of reserves so necessary to healthy life, business realizes that though retrenchment should be begun at once, the burden is destined to grow heavier.

"How can business have faith and confidence in representations today which are not only repudiated tomorrow, but are given the lie by actions not even conceived when the contract was offered for approval and acceptance?"

Why is business antagonistic to the administration which has sponsored the abortive measures comprising the so-called New Deal? It could hardly be otherwise, unless it welcomed the prospect of being permanently crippled by repeated kicks on the shins!

W. A. Lawrence

Beryllium and Beryllium Alloys*



WITH the development some years ago of a new series of copper alloys containing beryllium, this then comparatively unknown element almost overnight assumed a new importance in the metal industry. Many research laboratories are today investigating the possibilities of beryllium along new avenues of application and the prospects are that their efforts will be increasingly successful.

Nevertheless, beryllium as a metal is comparatively little known and its nature is not well understood. Generally speaking, it is available in large quantities and the selling price is within reason. But as yet the pure metal has not been drawn or rolled or cast in any form which will enable its physical characteristics to be tested in the usual way. It is known that its specific density lies between 1.83 and 1.85 and that its melting point is about 1278 deg. C. The pure metal has a silvery gray color and shows pronounced crystallinity.

Tiny disks have been produced by compressing finely powdered beryllium at high temperature in an

atmosphere of hydrogen. These disks have been used successfully for windows in X-ray tubes where the low ray absorbing property of the metal made such use advisable. Contrary to the opinion of many, beryllium has been found to be relatively brittle, although its crystalline structure appears similar to that of zinc, cadmium, and cobalt.

This is just one of many enigmas about the metal beryllium.¹

Of course brittleness in one state may not mean brittleness in another. The U. S. Bureau of Standards has produced wires of rhodium in spite of the extreme brittleness of the ingots, and the wire when produced lost its brittleness. It may be that the same phenomenon



SOME typical hand tools made of beryllium copper. Courtesy of Stanley Works, New Britain, Conn.

*History and metallurgy by M. G. Corson, consulting metallurgist; uses and casting technique by J. D. Zeiser, sales engineer for Ampco Metal, Inc.

will occur when someone succeeds in drawing beryllium wires.

Beryllium Alloys

One of the most persistent bits of publicity about the possibilities of beryllium centers around light, strong alloys for airplane construction. However, practical results in this direction have been slow to develop. Beryllium will alloy with a large number of metals. These alloys may be separated roughly into two groups, those which melt below 1000 deg. C. and those which melt above it. When considering those alloys in the first group, it should be mentioned that silver will alloy with beryllium in various proportions, but so far no outstanding silver-beryllium alloy has been discovered. The same applies to alloys of beryllium-aluminum and beryllium-tin. With lead, zinc and magnesium, beryllium apparently does not alloy at all.

In the second group, that is, alloys melting above 1000 deg. C., copper, nickel, cobalt, iron and platinum will easily alloy with beryllium. Even though the structural characteristics of these alloy systems are by no means identical, all of the alloys so far investigated

¹H. A. Sloman, metallurgist, National Physical Laboratories, Sussex, England, reports that pure beryllium is not brittle. The contrary impression, he thinks, comes from the extreme difficulty in obtaining metal in the pure state.

THE authors review the history of the interesting and valuable metal beryllium. In addition, various alloys of beryllium are considered both from a technical and a practical standpoint. The different properties of these analyses are listed, and attention is focused on characteristics fitting the various alloys to specific industrial applications. Beryllium alloys require individual casting technique; consequently correct foundry procedure is considered in detail.

have the capacity of dissolving larger amounts of beryllium in the lattices of their crystals at some high temperature, and of then precipitating it at a lower temperature in a new and harder phase. Consequently, by carefully controlled temperature ranges it is possible to develop hardening phenomena in all of these binary systems.

The simplest set of conditions seems to prevail in the nickel-beryllium series. At 1155 deg. C. nickel will retain about 2.8 per cent beryllium in solid solution, while not over 0.75 per cent can

remain in it at 450 deg. C. The excess precipitates in the shape of the second phase of the series, the nickel-beryllium compound (NiBe) with 13.4 per cent beryllium in it. This constituent has a very high melting point and probably a rather high hardness. Figuring that about 2.5 per cent beryllium will go into solid solution in nickel at 1100 deg. C., which is the highest safe and conveniently obtainable homogenizing temperature, we could expect to precipitate about 13 per cent of the total mass of the alloy in the hardening treatment at 450 deg. C. This is not so far from the 15 per cent of the mass precipitated in the hardening of a 1 per cent carbon steel.

For nearly-pure nickel, beryllium appears the only hardener yet discovered, but for manufacturing reasons not over 2 per cent of beryllium is added to nickel and a most frequent and convenient composition contains only 1.7 per cent beryllium. Beyond 1.7 per cent any additional strength and hardness is bought at the price of (1) increased difficulties in hot rolling and cold working; (2) very low ductility; (3) low resistance to impact; and (4) disproportional increase in the basic costs of the composition.

Table I illustrates some of the characteristics of nickel-beryllium alloys containing 1.7 per cent beryllium. The nickel-beryllium alloys become sensitive at high temperatures. Thus the hardened alloy may lose its stability at from 450 to 500 deg. C. At 450 deg. C. it will start to soften after 24 hr. but at 500 deg. C. it may soften after 5 hr. Cold working previous to hardening helps to correct this situation.

Nickel-Chromium Beryllium

Nickel-chromium alloys share with nickel a capacity to harden when alloyed with beryllium. The interesting point lies in the possibility of using a much lower amount of beryllium in the case of the nickel-chromium alloy than required with nickel. In the author's² investigation there appeared to be no need to go above one per cent beryllium to obtain the highest possible hardness in the nickel-chromium alloys, while 0.6 per cent beryllium gave a sufficient hardness for most industrial purposes.

A nickel-chromium-beryllium

²M. G. Corson



A LARGE outlet for beryllium copper is in the fabrication of tools which will not spark during usage. These typical Be-Cu tools (hammer and chisel) were made by the American Brass Co.

alloy developed in Germany shows promise of being industrially important. It is called Beryllium Contracid and contains 60 to 61 per cent nickel, 15 per cent chromium, 15 per cent iron, 7 per cent molybdenum, 2 per cent manganese, and 0.6 per cent beryllium. Some of its characteristics are given in Table II.

Under normal circumstances this Contracid alloy maintains about the same yield point and ultimate strength throughout the heat treatment, but it is possible by cold working to greatly increase the tensile strength at the loss of some ductility and some resistance to impact.

The difficulty in alloying beryllium with cobalt is overcome by first alloying cobalt with small amounts of iron or nickel. Such alloys will then carry over 2 per cent beryllium in solid solution at 1000 deg. C. With this 2 per cent the cobalt alloys do not go above 180 Brinell in the soft-quenched state, which means that they may be easily machined or cold rolled. At 400 deg. C. these alloys may be hardened to 500 Brinell in about 15 hr.

Iron and Beryllium

Iron alone does not seem to be a proper metal for hardening with beryllium, although the constitu-

tional diagram of the iron-beryllium series is evidently similar to that of the iron-carbon alloys. Up to 1.2 per cent beryllium there appears to be no observable hardening, but when the amount of beryllium reaches the neighborhood of 3 per cent, a hardness of 350 Brinell through heat treatment can be secured. With the addition of other elements, the effect of beryllium becomes much more important.

Stainless steels containing 14 per cent chromium can be hardened to 450 Brinell after alloying with 1.5 per cent beryllium, and still better results are obtainable for the rustless steels of the 18-chromium 8-nickel type. Here hardnesses of nearly 600 Brinell are obtainable from alloys with 250 Brinell in the quenched state. Investigation seems to indicate that this effect of beryllium on the rustless steels is unique, for no other element has been found, except possibly boron under certain conditions, that will produce in these rustless steels precipitation hardening.

The nickel-chromium-beryllium alloys and the beryllium rustless steel alloys are now in practical use in Europe, although still confined to the laboratory here. On the other hand, the United States has taken a leading position in the development of the beryllium-copper alloys.

Beryllium Copper

Table III gives the saturation point of beryllium in copper at different temperatures. All copper-beryllium alloys containing 2.85 per cent beryllium or over start to melt at 865 deg. C. Hence, to be on the safe side, 800 deg. C. is usually taken as the maximum temperature for the homogenization process. This slightly lower temperature helps to keep the alloy fine grained. At the lower temperature of 800 deg. C., however, hardly more than 2.25 per cent beryllium can go into solid solution, and it is these two conditions that have established the standard 2.25 per cent beryllium-copper alloy in the United States. In Germany a good deal of experimenting is being done with 2.5 per cent beryllium quenched at 750 deg. C., but this means that some beryllium must be out of solid solution when heat treated and this may form an obstacle in the way of excessive grain growth. To safely harden the

TABLE I

Characteristics of Nickel-Beryllium Alloys (1.7 per cent Be)

	Tensile Strength	Yield Point	Elongation, Per Cent	
			in 4 in.	Brinell 5/750
Soft-quenched from 1000 deg. C. (homogenized)	112,000	50,000	43	140
Hardened for 15 hr. at 450 deg. C.	174,000	107,000	25	420
Reduced in cold rolling by 30 per cent and hardened 9 hr. at 430 deg. C.	260,000	212,000	8	460

TABLE II

Properties of Contracid, a Ni-Cr-Be Alloy

	Tensile Strength	Yield Point	Elongation, Per Cent	
			in 4 in.	Brinell 5/750
Quenched from 1050 deg. C. (homogenized)	125,000	59,000	29	195
Hardened 4 hr. at 500 deg. C.	130,000	70,000	23	320
Reduced 30 per cent in cold rolling, then hardened 6 hr. at 450 deg. C.	180,000	167,000	8	430

TABLE III

Saturation Point of Be in Cu at Different Temperatures

Temperature (deg. C.)....	865	810	750	680	610	560	480	400
Beryllium (per cent).....	2.85	2.14	2.10	1.82	1.57	1.32	0.96	0.76

TABLE IV

Characteristics of a 2.25 Be, 0.5 Ni, 97.25 Cu Alloy

	Tensile Strength	Yield Point	Elongation, Per Cent	
			in 4 in.	Brinell 5/750
Soft-quenched from 800 deg. C.	70,000	31,000	45	110
Normal treatment, 300 deg. C.	175,000	134,000	6	340
Worked "4" hard, then hardened at 275 deg. C.	193,000	138,000	2	365



A GROUP of tools made from beryllium copper, part of a large order of sparkless equipment shipped to Java for use in an oil refinery. Ampco Metal, Inc., fashioned this equipment.

standard beryllium-copper alloys they should be treated at 300 deg. C. if no cold working precedes, or at 275 deg. C. after a reasonable amount of cold working. Table IV shows the characteristics of a 2.25 per cent beryllium-copper alloy containing 0.5 per cent nickel.

Production Difficulties

Making copper-beryllium alloys from copper and beryllium is a difficult and costly operation. Beryllium floats upon molten copper, and no flux is light enough to be penetrated by beryllium. The heat of fusion is about 280 cal. per deg. C. for beryllium metal against 78 for aluminum and 5.9 for copper. Therefore, it takes a lot of heat to cause beryllium to melt by itself. It does not evolve heat when dissolving in copper, and its continuously growing skin of oxide prevents it from being wetted by copper. Hence it takes much time to effect the alloying and quite a lot of beryllium can be lost (about 5 per cent of the total added). Therefore, the making of commercial beryllium alloys calls for the use of master alloys with 2½ to 10 per cent beryllium made either electrolytically or by direct alloying under controlled conditions. Nickel-base beryllium

alloys can be made easily, starting with metallic beryllium, because the alloying in this case is an exothermic process (like alloying copper with aluminum) and because molten nickel is 170 deg. C. hotter than the temperature required to melt beryllium.

Industrial beryllium copper alloys can be quenched from any temperature between 700 and 850 deg. C. without unfavorably influencing the final hardness, strength and ductility. However, alloys quenched from lower temperatures require more time and higher temperatures in the hardening treatment.

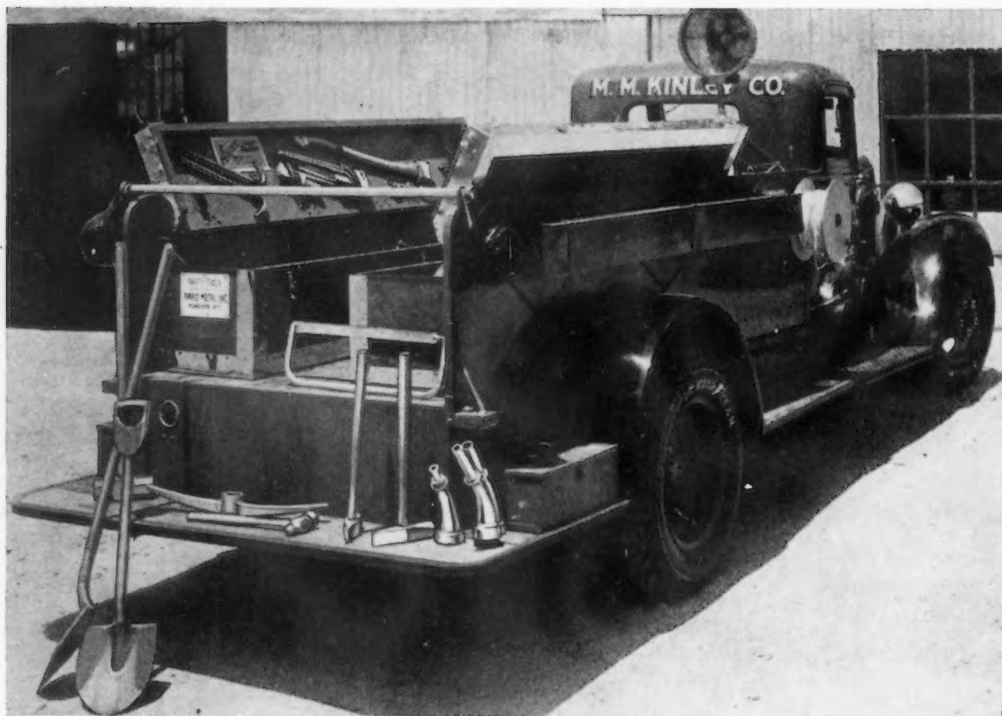
Cold work preceding the final treatment helps to obtain higher figures of strength and hardness. It also decreases the time of the second treatment and lowers the needed temperature. But it lowers also the temperature at which softening may begin.

All alpha alloys of copper can be alloyed with beryllium and will then become amenable to heat hardening. The amount of beryllium needed drops sharply. Alloys containing 5 per cent manganese will harden fully with only 1.5 per cent beryllium present, and with 1 per cent they will reach 260 Brinell,

while straight copper beryllium alloys of this beryllium content will not show over 140.

A different situation arises in the case of copper nickel alloys. Here both metals possess analogous boundaries of the alpha phase in their alloys with beryllium. When small amounts of nickel are added to copper they take hold of beryllium like iron takes away an anion (for instance SO_4) from copper and forms the beryllide, $BeNi$. The latter is well soluble in hot copper but almost insoluble in the cold metal. Therefore, good hardening qualities are obtainable in copper containing as little as 0.2 per cent beryllium if it carries 1.3 per cent nickel.

On the nickel's side conditions are different. Copper cannot take beryllium away from nickel but it reduces its solubility in nickel at all temperatures. Smaller and smaller quantities of beryllium are needed to harden nickel if increased amounts of copper are present. Alloys like Monel Metal harden thoroughly with as little as 1 per cent beryllium, but the maximum hardness obtainable is not so great (about 400). On the other hand, beryllium here finds competitors in aluminum and silicon whose solu-



TROUBLE trucks in the oil well district must be equipped with sparkless tools. This view shows a modern beryllium - copper tool outfit. Many of these castings are being produced by Ampco Metal, Inc.

bility conditions in nickel-base copper alloys are analogous to that of beryllium in the same alloys. Monel Metal can therefore be hardened to a nearly identical figure by any one of the following agents: 5 per cent aluminum, 4 per cent silicon, or 1.2 per cent beryllium. The price, however, is in favor of the aluminum or of the silicon.

Be-Cu, Uses and Casting Technique³

One of the largest single fields for beryllium copper with respect to tonnage lies in its use for non-sparking safety tools in industries having fire or explosion hazards. This comparatively new element of spark-proofness in alloys has been slow in gaining popularity because of the high cost due partly to the difficulties encountered in casting and heat treating. To date it has been most widely marketed in rolled, drawn, and extruded forms because of the greater ease with which it is handled. Some of the products made from the fabricated alloy include contacts and contact clips, springs, instrument parts, diaphragms, pump parts, and similar parts requiring high fatigue resistance. Now, however, beryllium copper castings are being regularly produced by Ampco Metal, Inc.

For many types of springs which

³ By S. D. Zaiser.

are required to resist corrosion, and for small machine parts where wear resistance is of importance or electrical conductivity plays a part, beryllium copper appears to be the only practical material now available, and, of course, in many of these cases the question of price is relatively unimportant. One thing must be remembered when using beryllium copper for springs. These may be made to take a large torque and will possess a high endurance limit, but if the heat treatment is faulty they may be handicapped by an appreciable lag. This lag of course does not interfere in many uses, but for fine electrical instruments, gages, and all precision work the lag is sufficient to become an obstacle. A pointer of an ammeter using a beryllium copper spring poorly heat treated may return to zero only after an extended interval, in some cases hours. In the case of a large electrical instrument with a scale 300 mm. long, a beryllium copper spring fully deflected may return to within 3 mm. of zero, but the accurate zero position may not be reached until two or three hours later.

Beryllium copper, due to its heat treatability and its resultant hardness, its comparatively good machinability in the soft state, and its resistance to corrosion, has many actual and many more potential uses. It is not, however, a truly

corrosion resistant alloy and, generally speaking, is in this respect slightly inferior to pure copper. It resists atmospheric corrosion somewhat better than plain copper or tin bronze, but not as well as aluminum bronze or copper nickel. In the case of non-oxidizing media such as organic acids and hydrochloric acid the situation is reversed. Tin bronzes and copper-silicon alloys are in this latter case more resistant than aluminum bronzes and beryllium copper. The use of beryllium copper for dies is still in the experimental stage, although some strong claims have been made. Excessive friction in some dies may cause a slow superficial anneal, and to offset this some investigators have tried beryllium-chromium-nickel with success.

Casting Technique

The generally accepted composition for beryllium copper castings is 2.5 per cent of beryllium. Higher percentages than this add little to the physical properties of the alloy, and lower percentages require a considerably longer period of heat treatment to obtain favorable strengths and hardnesses.

All refining of beryllium in this country is done by the Beryllium Products Corp. plant at Marysville, Mich., and all master alloy is (CONCLUDED ON PAGE 74)

Screw Machine Practice For New Free Cutting Aluminum Alloy*

By J. F. CONEEN

*Aluminum Co. of America,
Edgewater, N. J.*



ALUMINUM and its alloys have considerable differences in their machining properties. It is not surprising, therefore, that some changes in machining and tool practices are necessary according to the characteristics of the material desired for various applications.

Frequently those not thoroughly familiar with our screw machine alloys are inclined to associate

*From a paper presented by Mr. Coneen at a meeting of the Eastern division of the Screw Machine Products Association, held at the Engineers Club, New York, Feb. 7.

them with some of the other aluminum alloys that are not free cutting and on which comparatively little, if any, machining is required, machinability being supplanted by other characteristics of more importance for certain applications. Many materials not particularly suitable for fast machining operations have properties which are absolutely essential for other purposes.

The new screw machine alloy, designated as the 11S, was developed principally for the fabrication of parts on automatic screw machines, and with machinability comparable to that of brass. Considerable data have been accumulated regarding this alloy which indicates that it is adaptable to extremely high speed production. Using high speeds and feeds, good surface and dimensions can be obtained, the chips being well broken similar to brass.

The free cutting characteristics of 11S are compared with brass because brass is one of the older and better known free cutting metals. Materials other than brass that might be considered relatively free cutting could be used as a comparison, but would be of no particular significance.

Machine Problems.—The movements of automatic screw machines are quite rapid, and there are numerous instances in which it may be difficult to determine the cause of some undesirable condition. It may be the tool or, on the other hand, it may be the machine. For these reasons it is important to know the machining characteristics of aluminum screw machine stock to avoid confusing machine problems with those of the material. Details of one outstanding example will enable you better to visualize what I have in mind. The part was

formed, drilled and tapped part way on a multiple-spindle machine which had been in production the previous day, machining the same part from brass with a machine time of 2½ sec.

The tools were sharpened and the machine started in production with aluminum, but the tap produced threads that were badly stripped. It was the opinion of several production men that some changes on the tap were necessary. Before making any changes, I suggested that a test be made using brass. Aluminum was replaced by brass and the parts made had stripped threads similar to the parts made from aluminum. The machine was then adjusted to produce satisfactory threads in the brass parts. Aluminum stock was then put in the machine and the parts had excellent threads. Later it was decided that the time could be reduced from 2½ to 2 sec. machining aluminum.

Surface Feet of Stock.—11S aluminum screw machine stock can be machined, using the maximum spindle speed available for all standard types of automatic screw machines, for turning, forming, drilling, cutting off, etc. This material has been machined at approximately 800 stock surface ft. per min. and there was no indication that the speed was excessive. In fact, it is difficult to state how much this speed can be exceeded. From machine tests and from data obtained from actual production runs it appears that stock surface feet up to 800 is of no particular concern. However, by using high surface feet together with excessive feeds, the chips will be quite hot and a rough finish will be produced, but no noticeable effect on the tool is observed when making short tests. It is to be expected that the continued use of a feed heavy enough to produce an exceptionally rough finish on the work would cause a breaking down of the cutting edges. The same results could be obtained by using slower surface feet and excessive feeds. This indicates that the tool feeds are of more importance than the speed of stock. The same condition was noted in the case of brass when making comparative tests with aluminum, although the finish on the brass appeared to be somewhat rougher for a given set of conditions. This roughness was particularly noticeable on the finish



produced by the side of the tool when forming a flange. Further tests will be necessary to determine how much faster stock speeds, if any, can be used in machining aluminum as compared with brass.

Threading and Tapping Operations.—Each type of machine has a suitable speed, approximately one-third of that used for the other operations, which is considered good practice to use for all materials to avoid excessive wear of the machine spindle and to maintain a uniform length of thread. In some cases the threading spindle revolves continuously in one direction, the speed in relation to the work spindles being slower threading in and faster coming out. On other machines the work spindle

that rotates the stock is reversed from forward to backward to accomplish the threading operation. This action must take place the instant the clutch engages the mechanism which drives the stock in the direction desired.

Having one third the weight of brass, aluminum is an advantage in such cases, since the lower inertia causes less wear on the spindles, belts and motors.

Tool Steel.—Some form of high-speed steel is used in the tools for a large percentage of the metal cutting operations. The 18-4-1 steel is considered a satisfactory general-purpose material and is used for most of the high-speed tools, such as drills, taps, forming tools, etc. Carbon steel is used for many applications in which the cutting speeds are limited. For example, a 1/16-in. drill at 10,000 r.p.m. would be the equivalent of only 164 surface feet; for this reason many of the small drills are made of carbon steel.

Drills.—For shallow depth holes we favor the use of standard twist drills. For deep holes we prefer Bakelite or straightway two-flute drills. In any case, highly polished flutes are desirable; this is also

SPEEDS AND FEEDS EMPLOYED IN MACHINING 11S ALUMINUM SCREW MACHINE STOCK

PART NO. 1—KNURLED CAP NUT

Material: ¾-in. 11S aluminum screw machine stock.
Machine: Davenport multiple-spindle.
Spindle Speed: 3000 r.p.m.
Stock Surface Feet: 295.
Time: 1.4 sec. per piece.
Finish: Burnished.

Tools Used	Feeds Used	Brown & Sharpe Table
Combination box and center.....	0.015	0.012
Drill, 0.135 diameter and knurl.....	0.008	0.012
Drill, 0.135 diameter (flat point).....	0.008	0.012
Circular forming tool.....	0.004	0.002
Tap 8-32		
Circular cut-off 3/64 in. width.....	0.0055	0.0025

PART NO. 2—COLLAR BUTTON

Material: ½-in. 11S aluminum screw machine stock.
Machine: Davenport multiple-spindle.
Spindle Speed: 2400 r.p.m.
Stock Surface Feet: 314.
Time: 2.4 sec. per piece.
Finish: Burnished.

Tools Used	Feeds Used	Brown & Sharpe Table
Circular form tool.....	0.0032	0.0015
Circular form tool.....	0.0032	0.0015
Circular form tool.....	0.0043	0.0015
Facing tool.....	0.0012	.....
Circular cut-off 1/16 in. width.....	0.0027	0.0035

found to be an advantage drilling all metals. The standard twist drill can be used for reasonably deep holes, but the other two types are an advantage for the following reasons: First, the Bakelite is a twist drill having a slower twist than the standard, which permits the chips to pass out readily. When they are used for drilling Bakelite they have about a 60 deg. point. The point should be approximately 118 deg. for aluminum screw machine stock. Second, the straightway two-flute drills permit the chips to clear out of the flutes well and in many cases produce a smoother finish than twist drills.

Circular Form and Cut-off Tools.

—These tools are made in accordance with recommendations contained in the Brown & Sharpe Mfg. Co. handbook on "The Construction and Use of Automatic Screw Machines." Generally, forming tools are made to be used without top rake. In many cases it is necessary to grind them with some rake, however, to correct a slight error in the steps of the tool. When machining some metals, a top rake up to 5 deg. is advantageous and best for penetration of the material, but for machining 11S the top rake is not necessary. As a rule forming and cut-off tools are made with a half degree side clearance which will produce a smooth side finish.

For any material there is a limit beyond which it is not practical to form pieces with a side forming tool without support; as the side pressure becomes too great, the piece will spring or be twisted off. The limit is usually expressed in the form of a ratio of the formed length to the smallest diameter. For 11S this ratio should not exceed $2\frac{1}{4}$.

Box Tools.—The section of tool bearing on the diameter being turned should be ground on an 8 deg. angle and when set in place will be parallel to the axis of the work. The best chip condition when machining certain materials is obtained by grinding a 45 deg. groove in the tool, starting at the front corner and increasing the width as backed off, the groove to be within approximately 0.010 to 0.025 of the front cutting edge. This will produce a helical coil that will clear out of the holder. Omitting the groove when machining 11S will



produce a smooth finish and well broken chips.

Taps.—For tap sizes up to $5/16$ or $\frac{3}{8}$ in. diameter we prefer two flutes; for larger taps the number of flutes recommended by tap makers is usually satisfactory. These taps are generally used with cutting rakes or hooks as supplied by tap makers.

Chasers.—A 10 to 15 deg. rake on the cutting edge will produce good results.

On all threading tools it is important that the chamfer on the front be equivalent to not less than one thread in order to avoid pushing the material ahead of the tool, causing rough and distorted threads.

Cutting Lubricants.—There is a difference of opinion regarding the kind and grades of lubricants most desirable for use in machining various materials. This is not surprising considering the wide range of machines, tools, feeds and speeds.

For machining 11S aluminum screw machine stock, lubricants similar to those used for brass under the same conditions usually have been found satisfactory. The grade of paraffin oil regularly used for machining brass produces good results. If desirable, a small percentage of lard oil can be added. The percentage to be added can best be determined by trial.

Cutting tools require an ample supply of cutting lubricant, volume being more desirable than pressure.

Tool Feeds.—Generally, cam designers refer to the Brown & Sharpe handbook, previously mentioned, for tool feeds, when preparing cam layouts for automatic screw machines. Reference is made

to this book because most screw machine men are familiar with it. However, in many cases screw machine departments have prepared feed tables based on past experience with various tools; in such cases, the tables may be somewhat different from the Brown & Sharpe table. The feeds indicated in the 1934 and 1935 issues are increased considerably in comparison with those in the earlier issues. The feeds recommended for free cutting brass are applicable for aluminum screw machine stock. They are average feeds and if the work has any features out of the ordinary, it may be necessary to alter feeds accordingly. Brown & Sharpe recommend the same consideration when machining free cutting brass. In many cases the feeds can be increased; these can best be determined by the man responsible for the layout and knowing dimensional and surface requirements.

There are numerous instances in which the feeds on certain tools are of no particular importance, because they are performing the shortest operation. In such cases it is well to use a feed not less than approximately one-half of that which would be considered the normal. Minimum tool feeds in many cases may be the cause of unnecessary tool wear and are, therefore, not economical.

Men connected with the manufacture of screw machine parts have a background of all-round machining experience and it is not necessary, therefore, to attempt to cover all details for machining any kind of material. The information desired is some specific data relative to the standard tools. Having this they are in a position to determine conditions which are suitable for other operations.

Two parts have been selected from production runs as illustrations of speeds and feeds that have proved satisfactory in machining 11S. The feeds recommended in the Brown & Sharpe table for free cutting brass are included merely to indicate that the feeds for brass given in the table can be increased in many cases when machining 11S. Some feeds are considerably higher than the table and others are somewhat lower. These are not considered maximum feeds, because of overlapping operations or other conditions. Details are as given in the table on opposite page.

By A. F. DAVIS
Vice-President, Lincoln Electric Co.,
Cleveland

Air-Powered Scoop,



AN air-powered scoop, which features arc welded seamless tubular construction and is said to dig faster and easier and with less drawbar pull and which digs, carries and dumps by its own power without pump, winch, etc., has been announced by Midwest Piping & Supply Co., Inc., St. Louis.

No rivets are used in building this machine. The frame, which is welded from seamless steel tubing, serves as an air reservoir or pressure tank in addition to being the main supporting member.

Welded Seamless Tubular Frame

The frame (see Fig. 2) consists of two sizes of seamless tubing. The larger size—used for the bot-

greatest possible strength per pound of material used. It also eliminates the possibility of stress concentration. This latter advantage is inherent with arc-welded construction, since there is no lessening of the basic strength of structural members in order to make connections. The effective area of the members is in no way reduced. On the contrary, it is

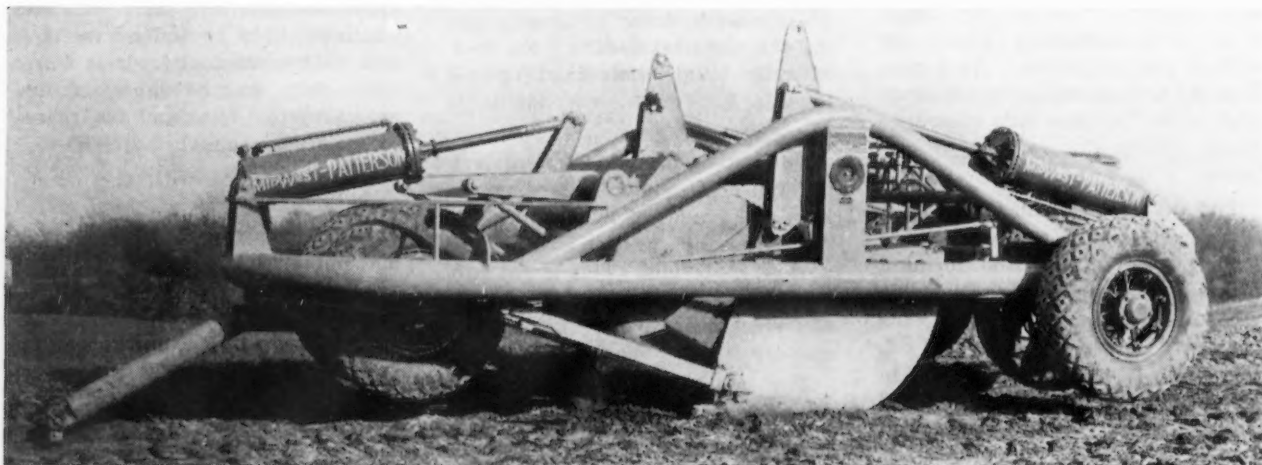


FIG. 1—Air-powered scoop, constructed entirely by arc welding and utilizing seamless tubular framework, digs, dumps or spreads under its own power, depending on tractor for motive power only.

This machine, shown in Fig. 1, is known as the Midwest-Patterson air-powered scoop. Its specifications are: Capacity, self-loading, 10 cu. yd.; depth of cut, maximum, 12 in.; bowl clearance, in carrying position, 18 in.; maximum dumping angle, vertical; depth of spread, up to 25 in.; wheelbase, 15 ft. 2 in.; overall length, 23 ft. 6 in.; length of cutting blade, 7 ft.; weight, 17,000 lb.; bowl construction, high-tensile steel, heavily reinforced, all welded.

tom and cross members—is 8½ in. outside diameter and weighs 28.55 lb. per ft. The total amount of this size tubing is 56 ft. The smaller size—used for the side members and bowl-raising member—is 6½ in. outside diameter standard weight tubing. There are 40 feet of this size tubing in the frame. Fig. 3 shows a close-up of the welding on the frame.

The arc-welded tubular frame construction employed in this road-working machine provides the

retained throughout the structure. The welded joints are, in reality, merely a union of steel members fused together by addition of new steel, the characteristics of which are equal or superior to the steel joined. This is true of the tensile strength, the ductility, the impact, fatigue and corrosion resistance.

The strong, continuous construction, uniform throughout the entire framing, enables the equipment to withstand the severe service to which it is subjected. The frame

Arc-Welded, Digs, Carries

And Dumps by Own Power

must give and take under constant twisting and turning stresses. Absolute rigidity is, therefore, impracticable. The necessary flexibility is provided by the special tubular construction and by the high physical properties of the welds.

Except for the cutting shear, which is bolted to permit detaching, the bowl of the scoop is also built entirely by arc welding. The $\frac{1}{4}$ -in. high-tensile steel plate and 1-in. reinforcing bands (at stress points) are welded into one integral unit. (See Fig. 4.)

All welding in construction of the machine is done by the shielded

arc process, with arc-welding generators and electrodes manufactured by the Lincoln Electric Co.

Welding Provides Many Economies

Arc welding provides definite economies of construction in addition to greatest possible strength. Construction is definitely simplified through a reduction in detailing, punching and handling of parts. Moreover, pattern expense, both in making and storing, is entirely eliminated. With arc welding the various parts are temporarily tack-welded together, then the entire

unit is placed in the jig shown in Fig. 2 and welded permanently together. No extra parts are required. Structural members are welded directly together without intermediate or connecting members. This simplicity of construction accounts for savings in materials and reduced weight. The unit welded weighs 3500 lb. less than with conventional construction employing rolled sections and castings riveted in the usual manner. An added advantage with welding is that slight changes in design can be made without the delay of waiting for pattern changes or foundry deliveries. Costs for

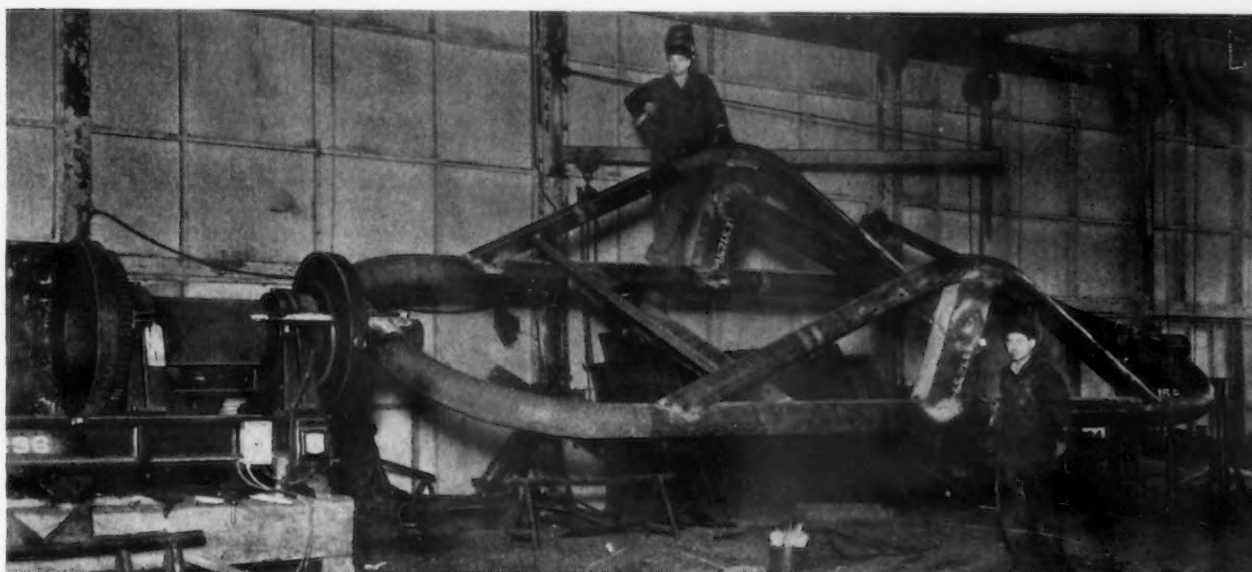


FIG. 2—Welded seamless tubular framework of air-powered scoop. This member, composed of two sizes of tubing, acts as a reservoir as well as a supporting frame. The illustration shows the frame in the special jig for welding.

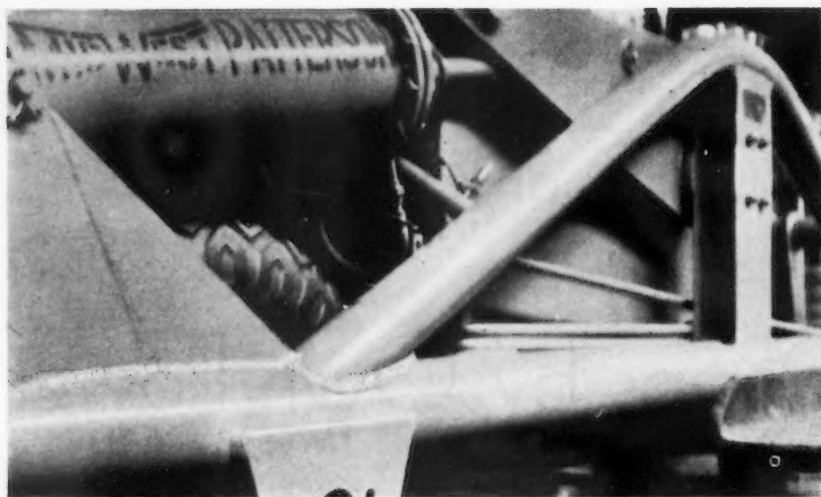


FIG. 3—Close-up of welded tubular frame. The welding, done by the shielded arc process, provides maximum strength together with highly desirable flexibility.

special roll dies are also done away with.

Operating the Air-Powered Scoop

In operating the Midwest-Patterson air-powered scoop, the bowl is lowered as the scoop is drawn by tractor or to load-gathering position. The bowl is brought to the correct cutting angle by a patented system of leverage control and air rams. This same system raises the bowl and latches it in carrying position when loaded. When dumping, the air rams turn the bowl to any desired position up to vertical.

The 90-deg. dumping angle is an important feature, and air operation provides a faster dump. There

is ample air reservoir capacity in the tubular frame. The 125-lb. air pressure is always available for inflating tires or for operating a stone drill in an emergency. The gas engine, air compressor and air equipment are standard units. The compressor is air-cooled; the engine is water-cooled.

The operator has adequate room for easy and convenient operation with full view of digging or spreading without changing his position. The depth of cut is always under immediate and accurate control. The low center of gravity, with large carrying clearance, provides maximum stability. An important feature of the unit is that, when the bowl is in down position, the wheels are raised free from the

ground. This facilitates extricating the unit when mired or when a tire must be changed. Even when mired, the scoop can be unloaded by its own power.

\$5,000 Home Price Too High for 75 Per Cent

APPROXIMATELY 13,029,393 families in the United States cannot afford a house costing \$5,100, according to a survey made by the Purdue University housing research project. This figure represents 75 per cent of all the families in the country and will extend as high as 80 per cent when the price bracket is raised to \$6,100.

Those advocates of huge building programs of small houses for the average man and his family can thus see into which price class these small homes must fall. And the question which must be considered and the problem which must be solved is how to build a trustworthy, comfortable home which will include most of the necessary conveniences pertinent to our standard of living, and still not exceed \$2,000 to \$2,500 in price.

With the average yearly wages in 25 industries only \$1,177.28 and the average net income per tax return only \$4,217, the necessity of this low cost for housing is readily apparent. The average man of the United States simply cannot afford to spend more—the average family is reported unable to spend over 25 per cent of income for rent. To make the picture still worse, these figures do not even take into consideration farm incomes, which when reckoned in terms of cold cash are often very small indeed.

Will Erect Experimental Houses

The Purdue research does not attempt to recommend a solution of the cost reduction difficulty, but is merely confining its work to a thorough study and cost analysis of house construction. To attain practical working figures the project provides for the erection of nine houses on the Purdue research campus, which will be constructed

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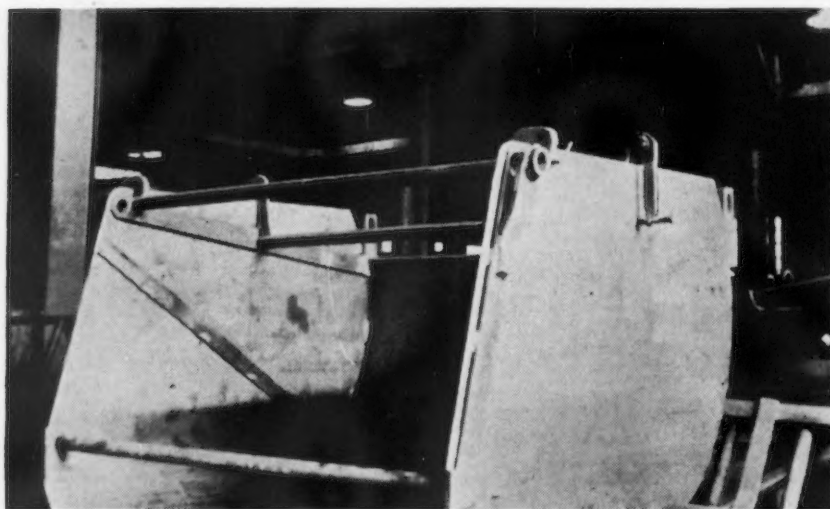


FIG. 4—Bowl for 10 cu. yd. air-powered scoop spotted ready for continuous seam welding. The bowl is of $\frac{1}{4}$ -in. high tensile steel and 1-in. reinforcing bands welded into one integral unit.

Why Penalize Experience?

What Is Wrong with Diemakers Over 38 Years Old?

By **GEORGE A. WALKER**
*Dover Stamping & Mfg. Co.,
Cambridge, Mass.*

o o o



THERE have been several advertisements lately for tool and diemakers not over 38 years of age. I wonder what is wrong with a diemaker that is over 38.

Is a man that reaches the age of 38 in the tool and die trade to consider himself all done and obliged to take up some other occupation? If so, why? What has he lost? Certainly not experience and skill. He has been 15 years in gaining these assets.

The average young man does not start to learn the trade until he is 20 or 21 years of age. It takes him four or five years to serve his apprenticeship, about ten years more of good all-around experience to put him where he can call himself a first-class diemaker. He has possibly made a good many mistakes in those ten years, but he has also profited by them. Good diemakers are born with the mechanical instinct and make-up that is necessary for their success in this trade.

If they have not this ability and instinct, they should be so advised before they get too far along in their apprenticeship. There are

many men in this trade today who will never be first-class diemakers and who would be much better off in some other occupation. This is one of the most skillful trades, wherein experience counts with skill in determining the value of the man.

We are fast approaching a time when there will be an acute shortage of skilled men in this trade. Some manufacturers are beginning to feel it already. A great many manufacturers are anxiously awaiting the time when business will pick up enough to enable them to go ahead with new dies and tools that they have long denied themselves and in many cases are sorely in need of. Most of the large plants that always had an apprentice school for this trade were forced to discontinue it during the depression. A great many of the good men in this occupation were obliged to look for other means of livelihood and now that they are in some other line of work, will not go back to the tool and die trade.

There is no better time than the present for manufacturers in this field to start training young men to alleviate this condition. When I see an advertisement of this kind, setting an age limit at 38 or 40, it makes me wonder if the writer of the advertisement really knows his diemakers.

I wonder if they realize how much harm they may be doing by scaring young men away from this

trade. I am sure that any young man with average intelligence would hesitate a long while before starting a trade where he knew he would have to look for some other occupation on reaching the age of 38 or 40.

You could not blame a young man after reading an advertisement of this kind if he gave up his apprenticeship, even though he had spent a few years at it. It certainly is no great encouragement for anyone to spend five years learning a trade if he knows he will have to look for some other means of livelihood at reaching the age of 38 or 40.

There are many lines of work where a man slows up at 40 years of age, especially in laborious and exacting occupations. But I do not believe tool and diemaking is one of them.

In a trade where skill and experience count for so much, I believe a man can be just as valuable from 35 to 55 as he was at the age of 25 to 35. He may not move as fast as he did between 25 and 35, but what he has lost in speed he will make up in experience and resourcefulness. He has been through the mill and usually knows what he is doing and how best to do it.

I certainly hope there are not many manufacturers who will set their age limit at 38 or 40. I feel they will be doing a rank injustice to any real diemaker that knows his trade.



Selling Rebuilt Not to Compete

PRODUCTS that are made of metal are likely to last a long while and this gives rise to a "second-hand" problem.

How do you keep the "used" product or machine from competing with the



ALMOST everybody in the metal goods industries has a type of competition that, at times, causes no end of trouble. I refer to the competition between new products and second-hand or "used" or rebuilt products. If you know someone in the durable goods field that does not have to struggle with this problem occasionally, he can count himself mighty lucky.

Yet there is no reason why the problem should exist at all. At least there is little excuse for it ever becoming serious. In most lines of business there should be virtually no real competition between new products and "used" products. The fact that such competition is often a trouble-maker in many lines is usually due to the toleration of unsound sales practices.

Discord arises only when the old and the new products are sold to exactly the same markets, and when both products are allowed to compete on an equal basis. Certainly there is bound to be grief when a "used" article is represented as the same as a new one, capable of performing the same work and of rendering the same

satisfaction both as to quality of output and life of the product.

Manufacturers who have been successful either in competing with "used" products or in marketing rebuilt machines of their own, never make these mistakes. Second-hand goods are sold for what they are—wonderful value for the money and still capable of doing a lot of good work, but not the equal of a new product of the same class.

Too Many "Improvements"

Probably the most common error that is committed in disposing of a "used" product, is when rebuilding it to incorporate in it all or most of the features of the latest model of the same manufacture. This is decidedly unfair to the new model. Naturally, the rebuilt product will have a big price advantage. Buyers will inevitably want to know why they should pay the much higher price for the new model when they can get a rebuilt model with the same features for vastly less money. It is futile to explain to these prospects that the used product, while it is a good buy for the price asked, logically cannot have the life expectancy of the new

model or that it cannot be expected to stand up so well under hard usage. In such cases, it is usually difficult to sell the new product until its rebuilt competitor has been sold out. When this is happening, and manufacturers control the distribution of rebuilt products in their line, they sometimes virtually withdraw their new models from the market until the rebuilt goods have been disposed of.

The best practice in handling this problem is not to rebuild the used products so elaborately. Most companies have found it best simply to make the old article workable. They may put in new motors or bearings or replace broken or badly worn parts, give it a new coat of paint and let it go at that. And, of course, that is as much as the buyer of rebuilt products expects. He wants the thing he purchases to give him good service and he wants it cheap, that is, much cheaper than he would have to pay for a new product of the same type.

How the Vacuum Cleaner People Do It

Several of the vacuum cleaner manufacturers have been dealing

Products—So As with New Goods



new product? That is an important question in many branches of our industry.

Mr. Murphy gives an interesting and instructive account of how the problem has been solved in a large variety of lines.

By JOHN ALLEN MURPHY

with this question in an intelligent manner. This industry is now old enough to have sold a cleaner to the majority of eligible buyers. So, in making new sales today it is necessary to take in an old cleaner on the deal in quite a percentage of cases. Most of these turned-in cleaners still have a lot of service in them. So the vacuum cleaner people repair and refurbish the old products and offer them for re-sale.

A prospective buyer seeing one of these good-looking revamped cleaners at one-third the price of a new one, might decide that it is the most economical product for her to get. The salesman usually will do nothing directly to block her intention. Instead he will say something like this. "Yes, madam, it is an excellent buy, but if you want a machine to do this and this and this," and then he launches into an enthusiastic description of the many improved features of the new cleaner. By this time, the buyer wants these features so badly that she would not think of purchasing the rebuilt product.

But there is a market for used cleaners—among that large element in the population that cannot

afford new cleaners. A number of industries have found, as has the vacuum cleaner business, that their used goods can be employed to educate non-users in the advantages of the product.

The woman who buys a second-hand cleaner because the price of a new one is beyond her purse soon finds the machine indispensable and when her economic position improves she is sure to buy a new cleaner. Tens of thousands of customers have been won for these electrical suction devices in this manner.

Educational Washing Machines

In some parts of the country, turned-in washers are doing educational work in much the same manner. Coin meters are attached to the used washers. They are then placed in the basements of apartment buildings, and tenants are invited to use them. By inserting a quarter in the meter a woman can do an ordinary-sized washing. The money thus received is usually divided between the retailer who owns the machine and the management or superintendent of the building.

Of course, the women who use

these "quarter" washers do not own a machine themselves. In fact, they may never have operated one before. Many of them, however, soon become enthusiastic about electric washers, and as soon as possible buy a new one for their personal use.

Typewriters

No industry has handled the rebuilt product problem more cleverly than the typewriter manufacturers. New machines and old machines are not sold on a competitive basis at all. They are marketed to a different number of second-hand typewriter dealers. This separate distributing organization is growing all the time. By far the larger part of the rebuilt typewriter business, however, is handled by the manufacturers, themselves. When used machines come in they are repaired, cleaned and put in first class condition. They are then offered for exactly what they will do. Many of them appear to be as good as new. Prospective typewriter purchasers will often ask why they should buy a new machine when they can get such fine rebuilt products for so much less. The salesmen will then tell these

buyers frankly that the old machines are not worth any more than is being asked for them. Prospects are informed that they will get less "mileage" out of used typewriters, that they will not stand up under hard office work, but that they will prove satisfactory for personal use.

When the owner of a rebuilt typewriter orders a part from the manufacturer or asks to have it repaired, a salesman is frequently sent out to see if the machine is worth repairing. If it seems to be far gone, he will suggest that it would be more economical to buy a new machine. No coercion is used, however. If the owner insists on a repair job, he generally gets it without further argument.

Another fine typewriter policy is the establishment of standard prices on old machines just as on new, \$35, \$25, \$15 or whatever they are. These prices are fixed and cannot be "gimmied" lower by a close buyer. This plan also places a relative difference in the value of old and new machines, and thus automatically removes the competition that might exist between the two.

As a rule, second-hand typewriters are sold to students, lawyers, doctors, school teachers and small business men, who have occasion to use a machine only occasionally. Experience demonstrates, however, that almost everybody who starts out with a used typewriter, eventually buys a new one.

"Seeing Things" Second Hand

An interesting "rebuilt" situation exists in the microscope and telescope business. In normal times there is usually a larger demand for used microscopes than can be supplied, for the better instruments at least, those ranging from \$10 up to several hundred dollars. Reputable dealers generally have a long waiting list of people who want to buy a good microscope at a bargain. For the most part these are students, research workers, hobbyists and small business men. These men feel that for all practical purposes a used microscope will serve them as well as a new one, and that for the money they have available, they can get a much better second-hand instrument than if the same amount were invested in a new one.

The principal source of used microscopes is hospitals, schools, scientific and industrial laboratories that are modernizing and are buying larger and more powerful equipment. In addition, of course, there are always some individuals offering microscopes for sale for one reason or another. All instruments of this kind bear serial numbers. When one is brought in by a stranger, the dealer, before he buys it, has to check with the police to make sure that it has not been stolen.

Pretty much the same story is true of telescopes also. There are usually several buyers waiting for every used telescope that comes in. Telescopes run into considerably more money than microscopes, on the average. A good instrument, for the amateur astronomer, may reach up into the thousands of dollars. Many well known men have telescopes of this type. Among them is Charlie Chaplin.

Used telescopes often come from estates that are being cleared up. Also erstwhile rich men in distress, who may have a good telescope, will find that it is property that is quickly convertible into cash.

Swapping Ford Motors

There is a big business in rebuilt Ford engines. This trade is handled in an unusual way. If an owner brings his car in to have his motor completely overhauled, he is told that it will take several days and that the cost will be so much, say \$60. It is suggested that if he wishes to avoid having his automobile tied up so long that he can have another motor that has just been fully rebuilt at the same cost as he would have to pay to have his own revamped. If he accepts the proposition, and there is no reason why he should not, he can turn in his old motor, have the rebuilt one installed and drive off in an hour or so.

Service stations rebuild these old motors during spare time. If extensive overhauling is required, they are usually sent to the factory for reconditioning. In any event this system maintains a constant turnover of used motors and keeps them from damming up the market.

Installment selling has greatly magnified this used product question. Repossessions by credit companies bring a constant flow of

second-hand goods into the market which have to be sold in competition with new products of the same nature. While the number of automobiles, electric refrigerators, soda fountains and other things sold on partial payments, that has to be "pulled back" by the sellers is not large compared with the total sold, still the matter presents quite a problem. The trouble is that the same merchandise has to be sold at least twice and in some cases three and four times.

As in the other fields I have mentioned, however, the menace has been largely removed from this problem, through the establishment of separate distributing channels for the reclaimed goods. An ever-growing proportion of repossessed merchandise is sold through a special trade. And for the most part it is sold to a class of people who cannot afford to buy the new merchandise. It reduces itself down to where they must take a used car or a used refrigerator or get along without.

Renting as a Prelude to Selling

Another way to utilize rebuilt products profitably is to rent them. A large rental business is done on scores of products. People who have only a temporary need for a thing or persons who are not in position to buy or those who figure it is cheaper to rent than to buy, make up a big enough market to justify the existence of numerous rental businesses. Almost everything that can be bought can also be rented—trucks, automobiles, motors, batteries, scaffolding, office equipment of all kinds, furniture, contractors' equipment, etc. Most renting organizations start with rebuilt products.

Many dealers in all lines handle new and used products. The "used" end of their line may either be sold outright or rented. Usually these activities are separated physically in the dealer's establishment. The rebuilt line is offered for sale or for rental on another floor or in another building.

Some companies rent new products and then after they have been used for a few months, sell them as rebuilt goods. A prosperous business of this sort was built up on portable compressors in an Eastern city. The compressors were rented either to large contractors, who had been awarded a

contract but who did not feel like buying extra equipment on the strength of this one job, or they were rented to small contractors who thought they could not afford to buy at that time. In a few months a representative of the owner of the machine approached the renter and offered to sell him the compressor, applying the rent paid as the first payment. Usually the renter was surprised that he had paid in so much, and, realizing that the machine was thus already substantially paid for, he generally bought it.

Repeal developed an odd phase of the subject of rebuilt goods. When repeal suddenly came, most pre-prohibition brewers were still carrying on in one way or another. However, for the most part their equipment was old and out-of-date. Many of the brewers did not have the cash available for the purchase of new equipment. So they had the manufacturers modernize it. Brewers who did have the money for new purchases, did not have the time to wait for the new equipment to be manufactured. So they,

too, in many instances had it rebuilt, at least as a temporary expedient.

"Used" Machine Tools

The practice in handling "used" machine tools and metal-working machinery is much the same as prevails in other fields. The obsolescence rate in these products is unusually high at the present time. The severity of competition among manufacturers in all lines has made it imperative that production efficiency be elevated to the *nth* degree. This requires high speed machines, precision tools and last-minute equipment of every kind.

Naturally this condition maintains a heavy supply of "used" production equipment. A study of this situation which I made recently, however, reveals no embarrassment in the market. In normal times there is always a steady demand for "used" machinery. It goes to manufacturers whose lines do not demand the last word in equipment and where the lower price of the used product is an advantage. The export market

also absorbs a large proportion of rebuilt machines. Manufacturers starting in business with slender capital are obliged to draw their equipment from dealers in second-hand machines. In fact, it is recognized in well informed circles that used machinery has contributed mightily to the development of manufacturing in the United States. Had it not been available thousands of inadequately financed young men would not have been able to start their enterprises.

From all this evidence it is a logical conclusion that there need be no unhealthy competition between new and used products. It is true that the depression caused an abnormal competition to thrive between these two lines. But now that the depression has slipped into limbo, troublesome rivalry between new and old goods will exist only where manufacturers rebuild used products to give them all the features of their new merchandise, or where no organized method of distribution has been set up for the rebuilt line.

Heavy-Duty Bridge Deck Is Of Cellular Construction

A CELLULAR, heavy-duty bridge deck, representing a further development of cellular steel building units, has been placed on the market by the H. H. Robertson Co., Pittsburgh. The new deck unit consists of a flat plate which lays on the stringer flanges of the bridge floor system. The plate is stiffened by inverted hot-rolled steel channels. The channels are spaced on 6-in. centers and are electrically spot-welded through the horizontal flange to the plate. The spot welding integrates the two elements so that they act in unison as a longitudinal beam. With the help of intercell trough filling the flat plate distributes a concentrated load laterally.

The standard width of each deck unit is four cells, or 2 ft. The most economical length, generally, is that which enables the unit to span over two stringer spacings (6 ft. 6 in., or less). However, the length may be anything desired up to 24 ft.

The floor units are handled very much as though they were wood planks having the same dimensions, the only difference being that the plane of the supporting steel work upon which they bear should be free from rivet heads, gusset plates and similar obstructions.

The plate element and the channel element may be varied in thickness as the load and span conditions vary in design requirements. Usual thicknesses of the plate are

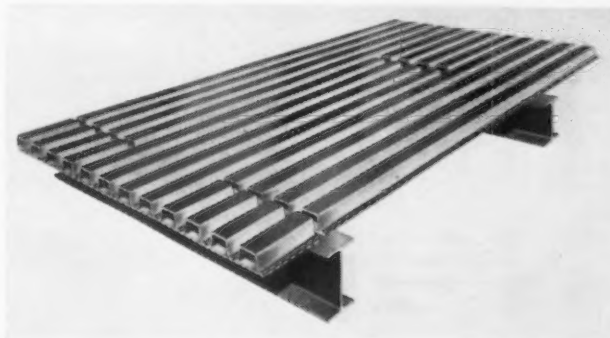
3/16 in. and 1/4 in. A 1/4-in. plate may be supplied when desired. The thickness of the horizontal web of the top channel element may be varied from 1/4 in. minimum to 5/16 in. maximum.

Three different methods of fastening the floor units to the supporting stringers may be used, as follows:

1. The flat plate element may be fusion-welded to the flange of the supporting stringer. In certain instances it will be necessary to sub-punch the flat plate element and slot-weld. In other cases fillet welding along the edge of the plate is possible.

(CONCLUDED ON PAGE 74)

DETAIL of heavy-duty bridge deck in place.



A Comparative Study of Worm



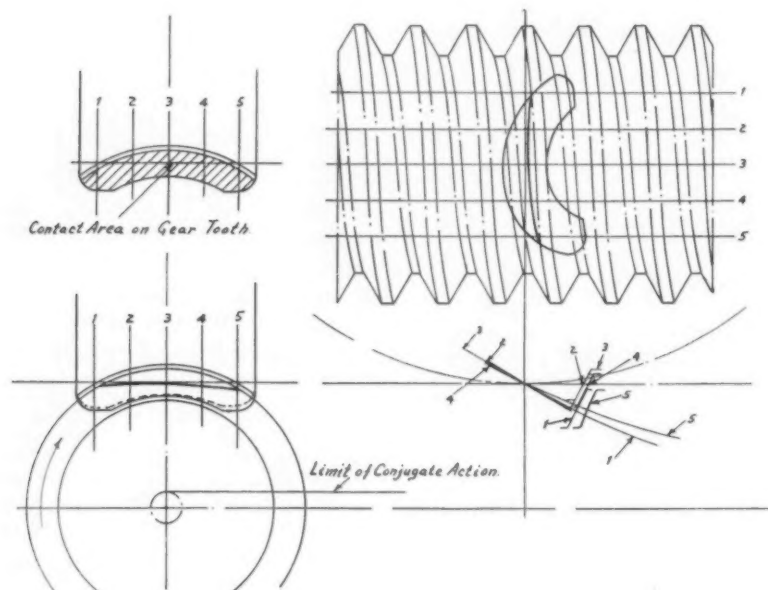
CONSIDERABLE uncertainty exists as to the exact nature of the contact between the worm and the worm gear on the many and various designs of this type of drive which are now available. The analysis of the exact contact conditions on any worm drive is a tedious operation, and but few appear to have the time or the patience to make it. Lacking the precise information

* Prepared for the Worm Gear Committee of the American Gear Manufacturers Association.

available from such analyses, it is easy to imagine and claim all sorts of contact conditions for any pet design. For example, surface contact is sometimes claimed for the Hindley worm and some of its variations. With rigid bodies and actual surface contact on any drive except one with the same axis for both members of the pair (such as a screw and nut), smooth, continuous action is impossible. Some difference in the curvature of the contacting surfaces is necessary to permit the relative rocking involved in the transmission of

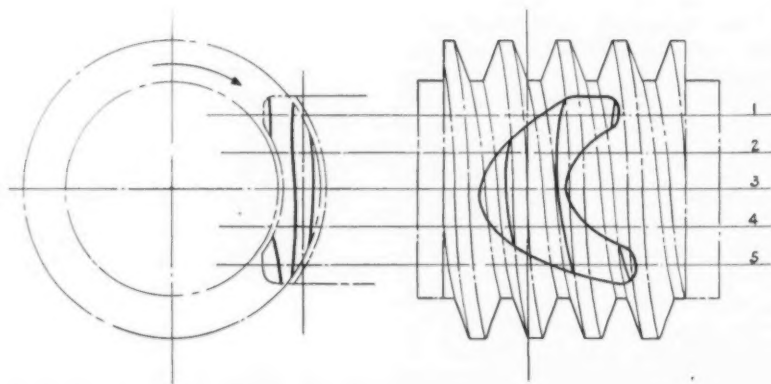
smooth, continuous motion. Considering elastic bodies—and all our materials of construction are elastic—all worm gear contact is surface contact to a greater or less degree. The amount of this surface contact depends upon the relative curvatures of the contacting surfaces, the elasticity of the materials and the intensity of the load.

Take a pair of spur gears as a simple example: With two pairs of spur gears of identical size and tooth form, one pair made of steel and the other pair made of cast iron; under the same load, the cast iron pair would have substantially double the amount of surface contact as that on the steel pair. As another example: Taking two pairs of gears of the same materials and otherwise alike except that one pair is double the diameter of the other pair—under the same load the larger pair will have substantially double the amount of surface contact as that on the smaller pair. In the first example, the increased elastic deformation of the more elastic cast iron results in a greater area of contact. In the second example, the larger radii of curvature, or the smaller relative curvature of the larger gears results in a greater area of contact.



ABOVE
FIG. 1—Field of contact.
Single tooth worm—40-
tooth gear—30 deg. basic
rack.

AT RIGHT
FIG. 1-A—Field of contact.
Single tooth worm—40-
tooth gear—20 deg. basic
rack.



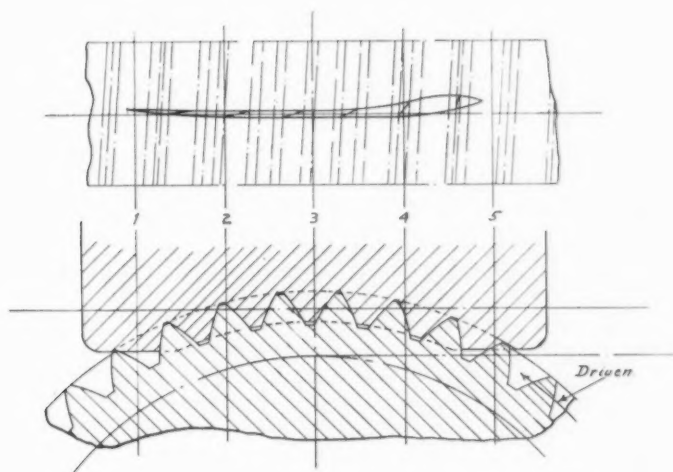
Gear Contact*

By PROF. EARLE BUCKINGHAM
Massachusetts Institute of Technology,
Cambridge, Mass.

Surface contact on an undeformed worm drive would act very much the same as a "flat" on the wheel of a trolley-car. Surface contact sometimes exists on an incompletely generated worm gear. Usually it acts to lock the drive, or else to limit the relative motion of the pair to a very small arc.

Three Types of Screw Gearing

There are three distinct types of screw gearing used to drive non-parallel and non-intersecting shafts. These are as follows:



First: Helical gears on non-parallel shafts, commonly called spiral gears. Both members of the pair have uniform axial leads, and the theoretical contact between them is point contact. Under load, with the deformation of the elastic bodies, the actual contact becomes surface contact with a very small area.

Second: Worm drives, where only one member of the pair has a uniform axial lead. In effect, these are a development from spiral gears, where one member of the pair has been made to partially

envelop the other so as to secure theoretical line contact in place of point contact. Under load, with the deformation of the elastic bodies, this line contact becomes surface contact with a very much larger area than that obtained on spiral gears.

Third: Hour-glass worm drives, where neither member of the pair has a uniform axial lead. The theoretical contact between the members of any such pair is line contact. Under load, with the deformation of the elastic bodies,

this line contact becomes surface contact of greater or less extent.

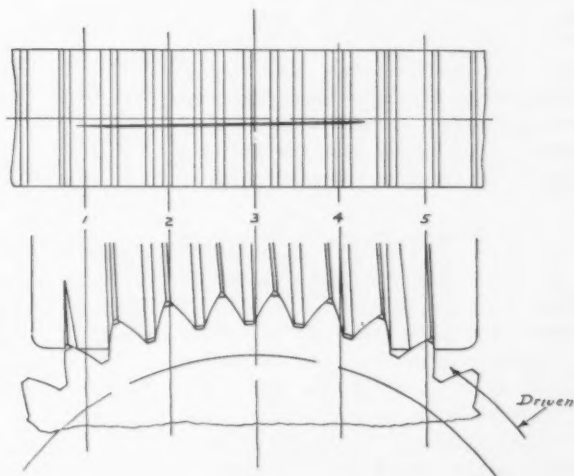
Contact Conditions Between Pairs of Different Designs

As definite examples for comparison, we will examine the contact conditions between several pairs of different designs, all having a single threaded or toothed member meshing with a 40-tooth member at a center distance of 6.763 in.

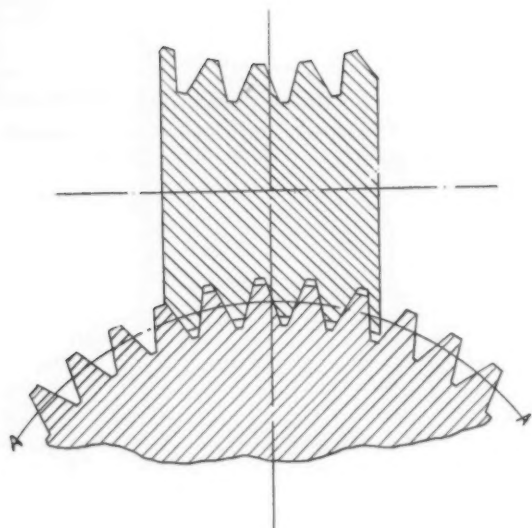
The first example will be a worm drive of conventional design. For the analysis of this type of drive, we will determine the profiles of the intersections of the threads of the worm, or helical member, with planes parallel to the axis of the worm, and treat these sections as rack sections meshing with the corresponding sections of the enveloping member.

In Fig. 1 are shown profiles and lines of action marked 1, 2, 3, 4, 5, which are the thread sections on planes marked 1, 2, 3, 4, 5, respectively. The projection of the line contact between the contacting teeth is shown on the end view and the plan view of the worm, for one specific position of the pair. This

ABOVE
FIG.2—Field of contact. 40-tooth worm—single tooth gear—30 deg. basic rack.

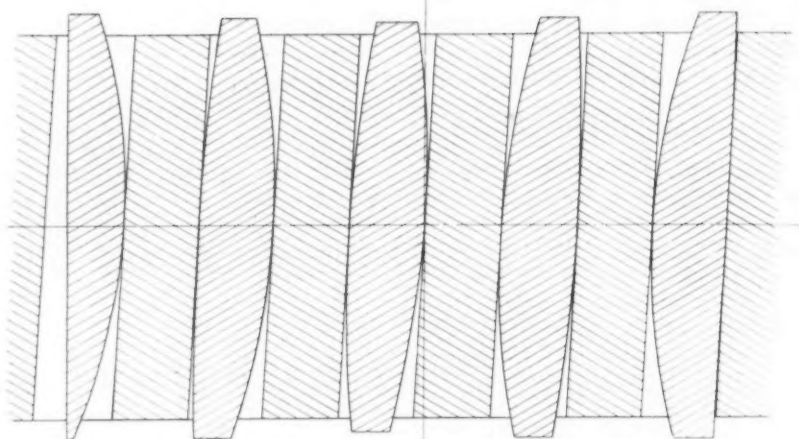


AT RIGHT
FIG.3—Field of contact. 40-tooth spur gear—single tooth enveloping worm—30 deg. basic rack.



AT LEFT
FIG. 4 — One-tooth
Hindley worm—40-
tooth gear.

BELOW
FIG. 5 — One-tooth
Hindley worm—40-
tooth gear.



line contact starts at the tip of the worm gear tooth as it comes into the field of contact and sweeps along as indicated by the heavy outline on the plan view of the worm. This heavy outline is the projection of the field of contact. In the position shown, a single tooth of the worm is in contact. As the action progresses, the following thread of the worm will come in contact so that for nearly half of the time, two threads will be in simultaneous contact. The minimum length of the contact line is about 2 in. This contact will sweep over the entire face of the tooth of the worm gear.

The worm shown in Fig. 1 has a thread angle of 30 deg. (60 deg. included angle). If this angle is reduced to 20 deg., the conditions shown in Fig. 1A would exist. In the position shown, three threads are in simultaneous contact. As the action progresses, the leading thread will go out of contact somewhat before the next following thread makes contact. Here two threads are always in contact, while three threads are in contact about one half the time. The minimum length of the contact line in this example is about 4 in. This contact will sweep over the entire face of the tooth of the worm gear.

Second Example

As a second example, we will start from the same pair of spiral gears, but will make the single-tooth member envelop the 40-tooth member. Here the driven member is the 40-tooth helical gear (or worm, strictly speaking), while the single-tooth enveloping member (worm gear) is the driving mem-

ber. This is shown in Fig. 2. This is not an hour-glass worm drive; it is a worm gear drive. Such a construction has been used on occasion by the Brown & Sharpe Mfg. Co. for over 20 years.

The analysis of this drive has been made in exactly the same manner as the preceding one. The projection of the contact lines and the field of contact is shown as before on the plan view of the helicoidal member. Here we have six teeth in simultaneous contact, the contact lines extending from the bottom to the top of the teeth of the enveloping member. The area of contact on the teeth of the helicoidal member will be of "U" shape, about 5/16 in. wide and about 7/16 in. deep. The total length of the contact lines will be about 2½ in. The entire surface of the teeth of the enveloping member, inside the ends of the field of contact, will come in contact with the teeth of the helicoidal member. The relative curvature conditions between the contacting tooth sur-

faces here are much more favorable than those on the first example. This means that the line contact will tend to spread out over a greater area as the surfaces are deformed under load.

Spur Gear Meshing With Hour-Glass Worm

As a third example, we will take a spur gear of 40 teeth, and make an hour-glass worm to mesh with it. Here we have no definite pitch surfaces, and the contact is analyzed by establishing the cam action between the threads of the hour-glass worm and straight teeth

of the spur gear. This is shown in Fig. 3. The projection of the contact lines and the field of contact is shown on the plan view of the spur gear. Here we have five teeth in simultaneous contact, the contact lines extending from the bottom to the top of the teeth of the hour-glass worm. The area of contact on the spur gear will be of "U" shape, about 1/8 in. wide and about 7/16 in. deep. The entire surface of the teeth of the hour-glass worm, between the ends of the field of contact, will come in contact with the teeth of the spur gear. The total length of the contact lines will be about 2½ in. The relative curvature conditions between the contacting tooth surfaces here are not quite so favorable as those on the second example in Fig. 2, but are much more favorable than those on the first example, Fig. 1.

As a fourth example, we will take a Hindley worm drive, a single thread worm meshing with a 40-tooth gear at the same center dis-

tance as before. A section through the worm axis of this drive is shown in Fig. 4. In order to study the contact on this drive, we will determine the trace, or intersection curve, of the hour-glass worm and that of the gear on a cylinder concentric with the gear axis. This intersecting cylinder is denoted as A-A in Fig. 4. We will then plot these intersection curves on a plane representing the unwrapped surface of this cylinder.

This has been done in Fig. 5. It will be noted that the forms of the worm thread intersections change materially, the one from the other. The traces of the worm teeth must be identical to each other. This gear-tooth trace will be that of the section of the hob (or hour-glass worm when the gear has been "run in") which removes

worm thread on the entering end, sweeping in a curved line from bottom to top of the worm thread, for not over 180 deg. of rotation of the worm. This last sweeping contact will tend to polish the entire face of the teeth of the gear, but the primary contact area on the gear teeth will be a line at the center of the teeth. If, because of wear or other causes, the primary contact at the center of the worm gear teeth is lost, the action will be slightly pulsating and heavy on the entering thread of the worm. The total length of the primary contact lines, in this example, is about 2½ in. The relative curvature conditions between the entering thread of the worm and the mating gear tooth surface are more favorable than that of the third example. These conditions on the

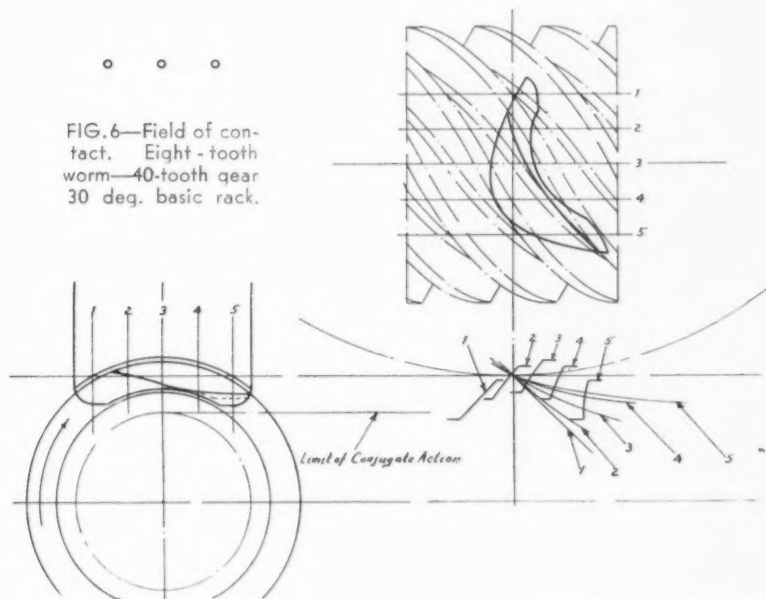
four succeeding threads are very nearly the same as those on the second and third examples.

Contact Conditions When Reduction Ratio Becomes Smaller

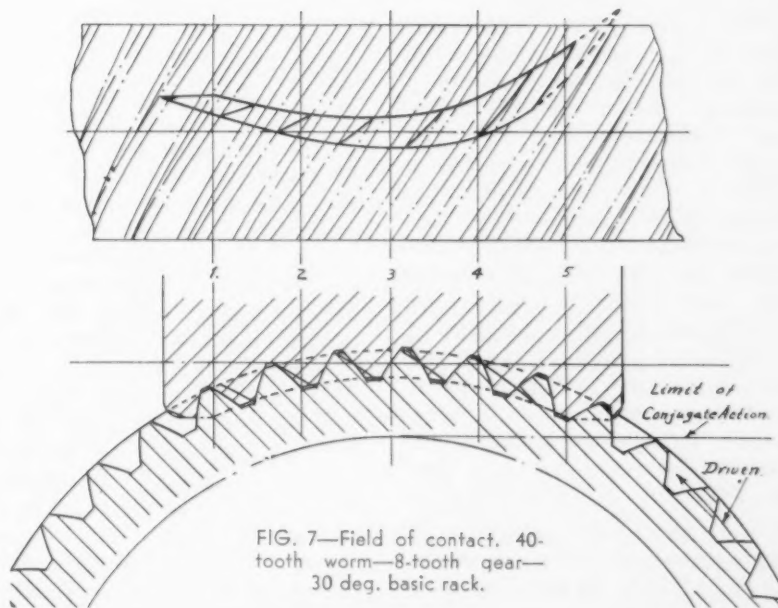
We will next examine the contact conditions that exist when the reduction ratio becomes smaller, and the lead angles of the worms become greater. We will use an 8-tooth member driving a 40-tooth member, which gives a reduction ratio of 1 to 5.

The first example will be a worm drive of conventional design with a center distance of 7.8175 in. In Fig. 6 is shown the thread profiles and lines of action at five sections of the worm, together with the projections of the contact line on the end and plan view of the worm, and the projection of the field of contact. In the position shown, a single thread or tooth of the worm is in contact. When the action carries this contact line ahead a small distance, contact will exist also near the root of the succeeding worm tooth, so that, for about one half the time, two threads will be in simultaneous contact. The minimum length of this contact line is about 2¾ in. This contact line is slightly longer, and the curvature conditions between the contacting surfaces are somewhat more favorable than in the case of the single thread drive of similar design shown in Fig. 1. This design shows some improvement with a reduction of ratio.

In this example, the pitch plane



the greatest amount of material. In the case of this single-thread worm, practically all of the surface of the gear is formed by the perpendicular (or most nearly perpendicular part used) of the hob or worm thread as it comes into mesh on the driving side of the thread. A very slight amount—too small to be shown on the drawing—will be removed from one side of the middle of the gear tooth at the smallest diameter of the worm. Here we have five teeth in simultaneous contact. The principal contact will be on a radial line of the hour-glass worm at the middle of the gear teeth. In addition, there will be intermittent line contact on the driving face of the



of the worm is at the center of the working depth of the thread on the mid-section. If this pitch plane were dropped to the root of the worm thread, two threads would always be in simultaneous contact, the contact lines would sweep in a curved path from the roots to the tips of the worm threads, and the total length of the contact lines would be about 2 in. The actual length of the contact lines would be a little less than that in the preceding example, but the relative curvature conditions be-

the contact conditions are improved on this drive over those on the 1 to 40 drive of similar design.

As a third example, we will take a Hindley worm drive of this same ratio and operating at the same center distance. The traces of the worm and gear teeth on a concentric cylinder to the gear are determined as before, and are shown in Fig. 8. In this case, one half of the trace of the gear is that formed by the perpendicular flank of the worm thread at the large end where it comes into mesh on the

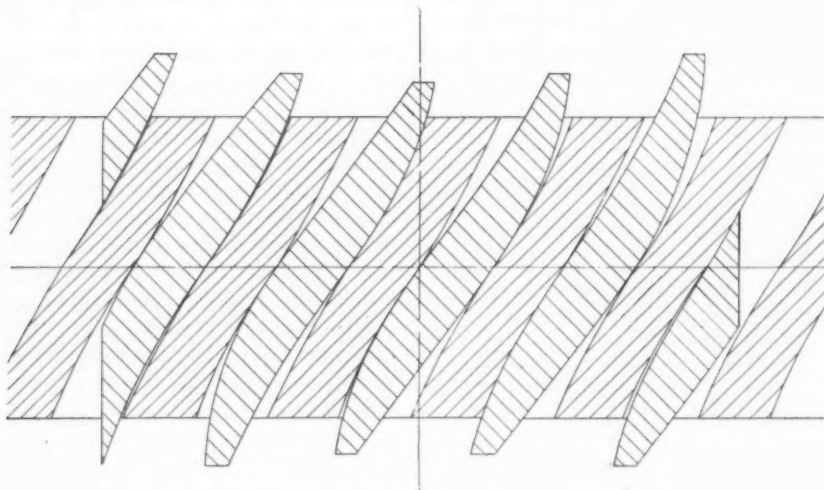


FIG. 8—Eight-tooth Hindley worm—40-tooth gear.

tween the mating surfaces would be more favorable, so that the load-carrying ability would be as great, or even greater than before.

Second Example of 1 to 5 Ratio

As a second example of this 1 to 5 ratio, we will start from the same pair of spiral gears as before, but will make the 8-tooth driving member envelop the 40-tooth driven member. The projection of the contact lines and the field of contact on the helicoidal member is shown in Fig. 7. Here we have five teeth in simultaneous contact, the contact lines extending from the roots to the tips of the helical gear teeth. The total length of the contact lines is about 3 in. The area of contact on the teeth of the helical gear will be of "U" shape, about $1\frac{1}{4}$ in. wide and about $7/16$ in. deep. The relative curvature conditions between the contacting surfaces are very nearly the same as those in the similar design for a single-thread driving member shown in Fig. 2. In many respects,

driving side. The other half is formed by the worm thread at its smallest diameter. The trace of the gear tooth is not a smooth, continuous line, but is formed by two intersecting curves, whose directions vary about four degrees where they intersect. This leaves an obtuse angle of about 176 deg. The primary contact is along the radial line of the worm at the center of the gear face where these two curves forming the trace of the gear teeth intersect. There are five teeth in simultaneous contact here, and the total length of the contact lines is about $2\frac{1}{2}$ in. In addition, there will be intermittent line contact on one half of the gear-face at the end where the worm thread enters, and on the other side of the gear face at the smallest diameter of the worm. This contact will be in a curved line sweeping from bottom to top of the worm thread and will persist during a turning motion of from 20 deg. to 25 deg. of rotation of the worm. In many respects the contact conditions here are not so favorable

as those on the single-thread Hindley worm drive shown in Fig. 5.

Trade Publications

Overhead Handling. American Monorail Co., Cleveland. 24-page illustrated catalog describing installations and products, including monorail lifts, dipping machines, scales, special carriers, trolleys, tracks, cabs, etc.

Air furnaces. Despatch Oven Co., 622 Ninth Street, Minneapolis. Bulletin describing and explaining convected air tempering furnaces heated by gas. Includes illustrations, diagrams and specifications.

Rolling doors. Kinnear Mfg. Co., 820-870 Field Avenue, Columbus, Ohio. Catalog pointing out advantages of product, scope of service, descriptions and illustrations of installations, fire doors and general specifications. Includes diagrams.

Ovens and dryers. Gehrich Corp., Long Island City, N. Y. Catalog illustrating industrial installations and describing features of construction, safety features, methods of handling, fuels and heating systems and advantages.

Acid-Proof Materials and Construction. Custodis Construction Co., Inc., 135 William Street, New York. Catalog devoted to acid-proof brick, paints, cement, Custodis-Kabe insulating membrane and Custodis acid-proof Zeta construction for towers, chimneys, flues, scrubbers and pickling tanks.

Dial Indicators and Precision Measuring Instruments. Federal Products Corp., Providence, R. I. Catalog, 60 pages, illustrating and describing more than 24 models of dial indicators, and a wide variety of dial gages. The gages include depth, comparator, bench, thickness, caliper, cylinder test, small hole, wire measuring, lead testing, pitch diameter, and Arnold automatic grinding gages. Dial indicators combined with Brown & Sharpe test sets are described and illustrated, and construction and dimensional data are given.

Floodlights. Crouse-Hinds Co., Syracuse, N. Y. Catalog. A compilation of bulletined information on flood lighting, largely as it relates to outdoor sports at night. Applications for industrial purposes are easily visualized.

Smoke Recorders. Leeds & Northrup Co., 4900 Stenton Avenue, Philadelphia, Pa. Catalog. A full and illustrated presentation of "Micromax" smoke-density recorders as applied to varied industrial service.

Fans. Emerson Electric Mfg. Co., Inc., St. Louis, Mo. Catalog. Descriptive of a complete line of cooling and exhaust fans for industrial purposes.

Turret Machines. International Machine Tool Co., Indianapolis, Ind. Bulletin. Point by point presentation of design and construction of the company's "Uni-Flex" general purpose lathe. Illustrates with a large symbolized cut of the machine and equipment.

Triple Hydraulic Action Features Design of Huge Press

AN 830-ton, triple-acting hydraulic press for the Ford Motor Co. plant at Geelong, Australia, has recently been completed at the Baldwin-Southwark Corpn. Eddystone plant, Philadelphia.

The press utilizes direct-acting hydraulic cylinders—a relatively new development in triple-action presses, features of which are the subject of patent application.

There is a clear distance of 132 in. between guides, while the maximum "daylight" is 72 in.

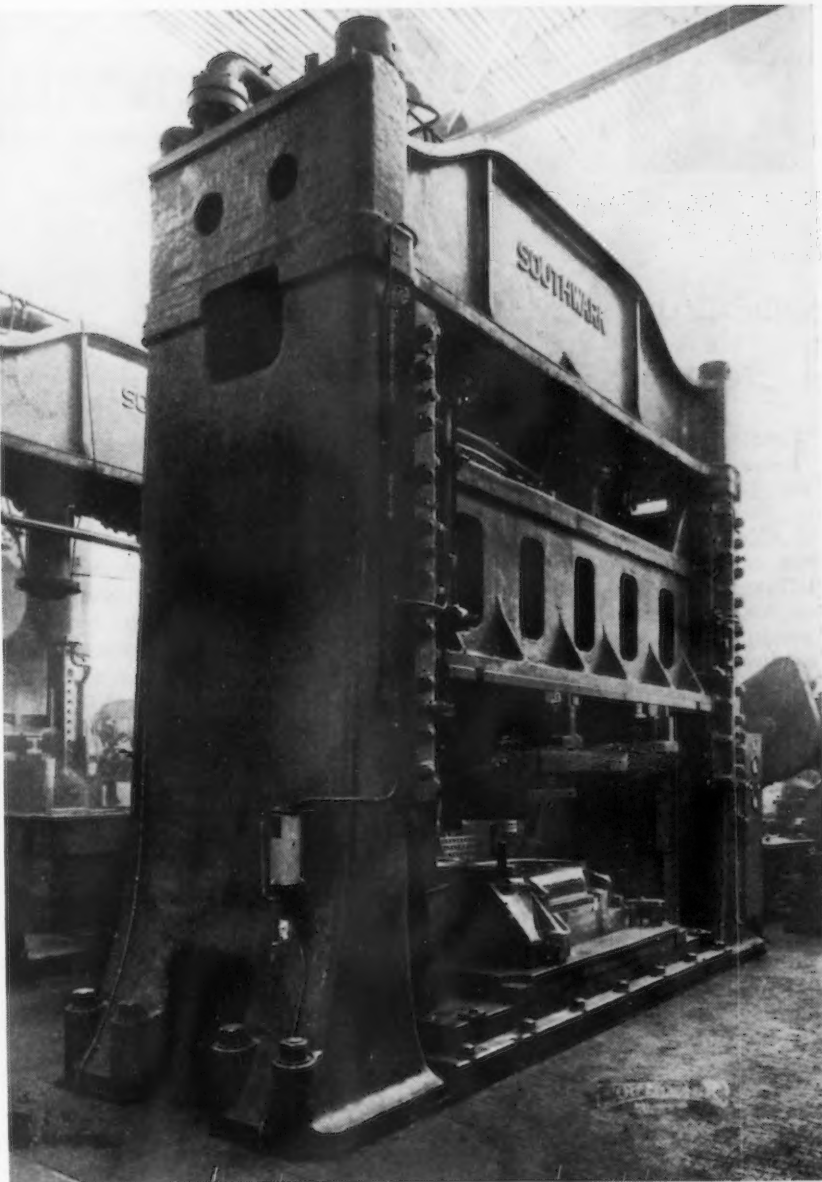
Four screw stops on the outer slide allow a varying amount of clamping pressure to be applied at each of the four corners; four cylinders are employed, each with 26-in. stroke and yielding 230 tons.

For eccentric loading, the inner slide is equipped with a horn type guide. The guide for the inner slide has an equivalent length of 144 in. This features a patented construction giving a guide length more than equal to the width of the slide. Adjustable bronze gibs are mounted on a rocking backing piece so that full bearing of the bronze gibs is assured. The two draw cylinders in this inner slide produce a pressure totaling 600 tons. A working stroke of 42 in. is found in the inner slide.

The bottom action has a 12-in. stroke. It consists of a push-up cylinder and two main cylinders of 480 tons total. This can be used as a third action or as a die cushion.

An automatic valve in the line to the cylinders which return the slides to their upper positions prevents the slides from dropping in case of motor failure or accident.

All load-carrying members on the machine are either cast or forged steel. The lower cross-



member, the upper cross-member, all slides and cylinders are cast steel, while the tension rods are forged.

Controls are grouped together. Practically four stories in height, the press stands more than 20 ft. off the ground, while over 14 feet of the huge machine is below the floor level. Approximate weight is 350,000 lb.

A DEMONSTRATION of V-belt drive for airplane application is announced by the Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., as highly satisfactory. Six stock Condor V-belts were used in a 300-hr. government supervised run. The test involved the driving of an airplane propeller from a stock automobile motor fueled with ordinary grades of commercial gasoline.

Convenient Rule for Many Industrial Uses

A COMPACT, vest pocket case, 2 in. x 9/16 in., holds a new Lufkin Rule Co., Saginaw, Mich., "Mezurall" rule, suitable for a wide variety of industrial uses.

The case has three flat edges. These are utilized in giving support for three measuring positions, i. e., with blade projected horizontally, upward or downward. For inside measurements, the square back edge of the case butts one side of the opening under measurement, the blade is drawn out in the usual way, and 2 in. is added to the indicated blade figure, 2 in. being the case length. The blade is stiffened by concave forming and can be projected unsupported and yet retain tape flexibility. It remains set at any withdrawn position.



Improvements in Production

Spectrum Measuring Microscope Determines Metal Expansion

THE spectrum measuring microscope here pictured has been designed by the Bausch & Lomb Optical Co., Rochester, N. Y., for the rapid and precise measurement of the linear intervals between spectrum lines on the photographic plate. Its precision and accuracy make it applicable, however, to a wide range of work, such as measurement of the thermal expansion of metals and the elongation of test specimens in creep tests under load.

The photographic plate or other object to be measured is carried in a horizontal position upon a sliding table to which a glass scale is rigidly attached. The object is therefore in constant fixed relation with a measuring device which is itself constant. The scale is 250.0

mm. long, ruled directly upon a thick glass plate and is read by transmitted light. The magnified image of scale and vernier is projected by a microscope objective upon a horizontal ground glass screen underneath the eyepiece of the reading microscope.

For the operator who is measur-

ing spectrum lines, there is added to the observing microscope, behind the objective, a small slide carrying interchangeable spherical and cylindrical lenses. When the cylinder is in position and adjusted so that its axis is perpendicular to the spectrum line, the images of the individual silver grains are drawn out into overlapping lines giving the image a smooth appearance in which all evidence of grain is absent. The spherical lens, which interchanges with the cylinder, serves to keep the system parfocal.

Safety Switch Has Floatingly Supported Blade

THE Bull Dog Electric Products Co., Detroit, announces a new safety switch designated as—Vacu-Break.

The switch is a laboratory product and is manufactured in each, a

master, a standard, and a junior type.

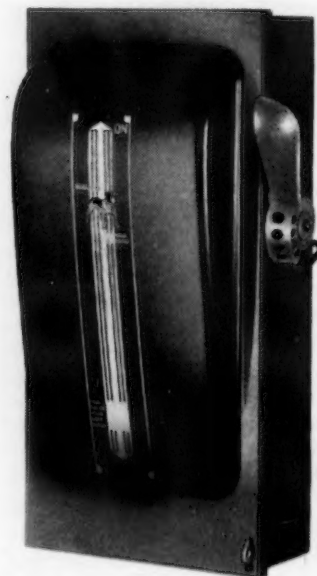
The contacts consist of a moving blade, floatingly supported within an inclosed arcing chamber. The mechanism forms an integral member, which moves in and out on beveled stationary contacts. The amount of bevel is a factor which was determined by experimentation and tests over a considerable period of time. Its determination also involved exhaustive tests with reference to size and shape of the blade



PRECISION and accuracy feature use of the microscope for such work as measurement of the thermal expansion of metals, and the elongation of test specimens in creep tests under load.

o o o

THE make and break spring in this new switch is not a necessary adjunct to the actuating of the switch.





itself to provide for perfect arc control.

The arcing chamber provides the experimentally determined amount of air space in minimum to support combustion and in maximum for expansion of the small amount of ionized gas incident to arc rupturing. Experimental work is said to have involved endurance equal to twice the number of operations which a switch would normally undergo in a lifetime of use. These tests were conducted on circuits carrying twice the amount of load that would normally be encountered.

The design places the arc extinguishing structure on the moving contact blade. The extinguisher is in the form of a partitioned chamber, inclosed except for two slots at the bottom to receive the dual stationary contacts in separate cells. This chamber, in which the moving contact is floatingly supported, moves with the moving contact in and out on the stationary contacts, as guides.

Such piston action of the contacts when rupturing within the close-fitting arcing chamber tends to evacuate the small amount of air present in the restricted inclosure, thus minimizing burning by reducing available oxygen—the tendency is also to restrict the amount of ionizable gas present to conduct the arc incident to rupturing the circuit. The close-fitting arc chamber constitutes an efficient de-ionizing medium for any ionization that may take place.

Extreme compactness is possible because arcing cannot enter the main inclosure or cabinet.

A double sealed arc condition prevails, first within the arcing chamber, and second, by the cabinet itself. This is said to permit, with safety, operation under extreme overload conditions.

Inasmuch as the arcing chamber, carrying the blade, is guided into contact directly by stationary contact jaws, the design provides for full and positive contact; the stationary contacts remain partly inserted within the slots of the arcing chamber, even in the "off" position of the switch. This feature provides against the entry of dirt and dust.

Horizontal Two-Way Hydraulic Miller For Simultaneous Face Finishing

FOR simultaneous face milling opposite sides of castings such as compressor housings, engine frames and cylinder heads a production type horizontal two-way opposed hydraulic feed face milling machine has been brought out by the Defiance Machine Works, Defiance, Ohio.

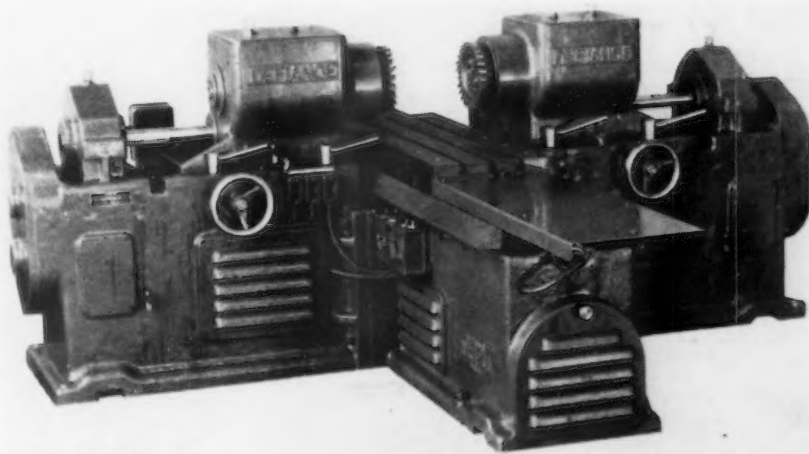
The base of the machine is made in three sections, is exceptionally heavy and rigid, and is of cored design. The center section carries the table on dovetailed ways, while each end has dovetailed ways on which the heads are mounted.

The table has hydraulic feed which provides an automatic cycle of fast advance, feed, and rapid return to stop. By providing additional dogs, the cycle can be arranged so as to give a fast advance, feed, skip, feed and rapid return to stop. The table can feed in either direction by simple adjustment of control dogs. The working surface of table is 18 in. wide by 36 in. long and length of travel is 48 in. The control can be adjusted to give from 1½ to 40 in. feed per min., while the fast travel is 240 in. per min.

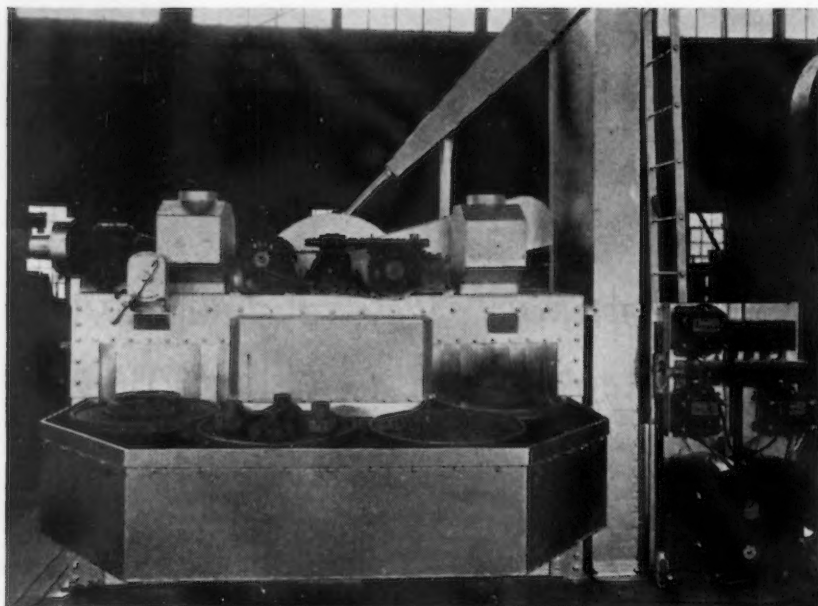
The heads are fully inclosed and have force feed lubrication. The cutterhead spindles are mounted in Timken bearings and have standard milling machine noses. All spindles and gears are of heat-treated alloy steel. Heads are arranged for V-wheel drive. The maximum distance between spindle noses is 21 in. The heads can be adjusted by means of handwheel and screw, to give a minimum distance between spindles of 11 in. Spindle speed changes are obtained by means of pick-off gears.

Face milling cutters up to 12 in. maximum diameter can be used. The machine illustrated is equipped with 10½-in. face milling cutters that operate at 42 r.p.m. The spindles may be revolved in either direction by reversing the motors.

The working height of the table is 34 in. The machine is 134 in. long and its length with full travel table is 192 in. Its width is 131 in. and its height 52 in. Net weight is 19,000 lb. For driving each head a 7½-hp. motor and for the hydraulic feed a 5-hp. motor is recommended, each with a speed of 1200 r.p.m.



PROPOSED face milling on castings, housings, etc., is facilitated by design features which involve improved automatic control and convenient working height.



Selective Rotary Tables for Blast Cleaning

A SERIES of rotary tables, variable in number and size, is announced by the American Foundry Equipment Co., Mishawaka, Ind., for its "Wheelabrator" blast equipment. A guide under the center of each table runs in a track and carries the table for an approximate distance of six feet directly in the path of the blast. Each table has a flat vertical side which contacts a moving belt to revolve the table. The speed of the belt is variable, thus providing adjustable speed of rotation as well as speed of travel. After passing under the blast, the tables follow

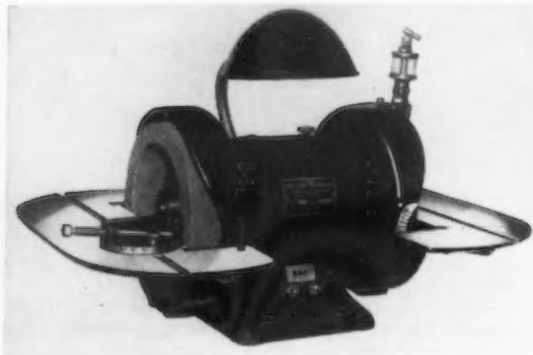
the track from the blast cabinet, where workpieces can be either removed or turned for a second blast application.

The cycle of operations consists of an abrasive load in an overhead hopper. From the hopper the abrasive is fed through chute and control gate to the center of a patented wheel. By centrifugal force the abrasive is thrown from the blades of the wheel onto the work. Spent abrasive falls into a hopper which feeds to a screw conveyor into an elevator bucket for reentry into the overhead hopper.

Cemented Carbide Tool Grinder

AN addition to a cemented carbide tool grinder line, as built by Thomas Prosser & Son, 15 Gold Street, New York, involves two

quick setting tables, accurately planed and slotted and having a graduated index mechanism for each table. The design provides for both rough and finish grinding of cemented carbide tools with cup wheels, to accurate angles with flat surfaces. The finishing wheel may be either fine grain silicon



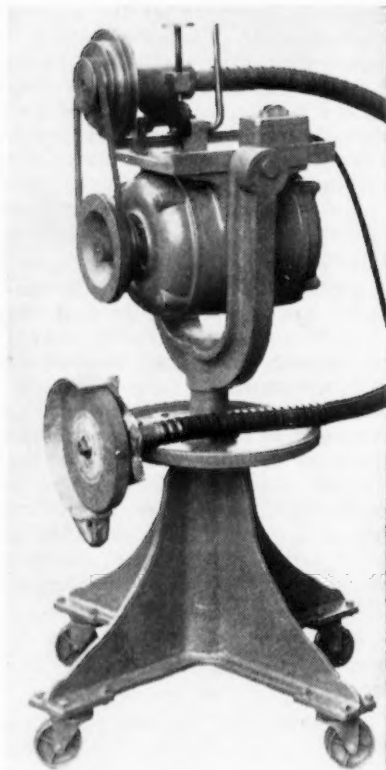
CUP-WHEEL grinding of cemented carbide tools is simplified by design refinements in this improved grinding equipment.

carbide or diamond impregnated grinding wheel may be used. In the later event, an oil feeding attachment is provided for keeping the face of the diamond wheel well oiled when in use. It is stated that both waste and breakage of cemented carbide are successfully reduced by this new, "A A" model grinder.

Flexible Shaft Unit With Swivel Mountings

THE portable, flexible shaft machine for miscellaneous production work, shown below, equipped for grinding wheel work, has been brought out by Stow Mfg. Co., Inc., Binghamton, N. Y.

The mountings swivel in both vertical and horizontal planes and



are ball bearing equipped. Cam action on pulley head facilitates the changing of speeds by quickly shortening center distance. The head is also provided with screw adjustment to take up belt stretch.

Interchangeable attachments provide for the use of sanding disks, polishing pads, cup-shaped brushes, etc. Grinding wheels, scratch brushes, chucks, rotary files, etc., can be used on straight hand piece furnished in sizes from 1/4 to 2 h.p.



DESIGN changes provide for added toolroom utility, involving continuous finishing operations at variable speeds as well as hand-sawing, in this new "Do-All" equipment.

Increased Utility for Band Sawing Machine

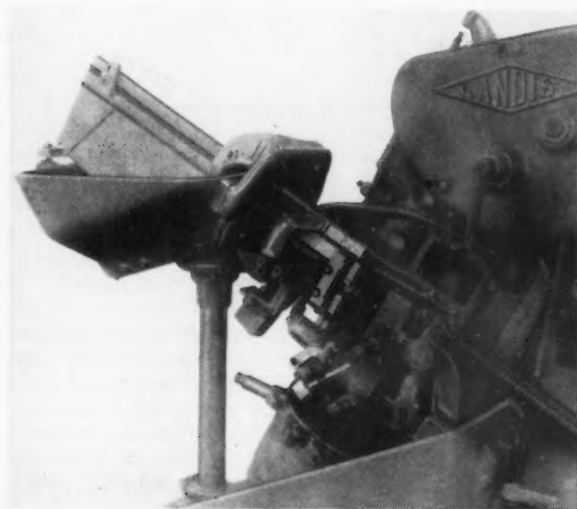
IN addition to its function of internal and external precision band sawing with narrow blade band saws and precision band filing, the 1936 "Do-All" tool room machine, built by Continental Machine Specialties, Inc., Minneapolis, Minn., combines a feature of an endless band of emery cloth for continuous polishing and grinding. At the point of work, the emery cloth band is backed up

by a rigid plate. Variable speed permits rough, fast grinding or fine, high polish finishing. The square table surface can be tilted in two directions. An automatic electric brazing unit is conveniently positioned on the front top of the base for the brazing of band saws for internal work. This operation is said to require less than two min., the longest time required for any operating change over.

Auxiliary Magazine Feed for Bolt Equipment

FOR the purpose of increasing length capacity of its automatic threading and forming machines, from 6 to 7½ in., the Landis Machine Co., Waynesboro, Pa., has developed a magazine feed which

can be attached directly to the standard hopper. Bolts are placed in feeding chutes by hand, after which they are automatically fed to grippers, pointed, threaded and ejected. Magazine capacity range



RESTRICTIONS as to length of bolt-threading work are lessened through a new magazine feed which can be used in connection with previous bolt-handling equipment on "Landis" machines.

is up to 2½-in. length of thread on 3/16 to 1-in. diameter bolts from 2½ to 7½ in. long and with head thicknesses up to 1¼ in. Length of chute is 35 in. from the loading to the feeding end. The maker recommends the equipment for lengths over 6 in.

Small Mercury-Break Switch Is Noiseless

A SMALL, compact electric switch, silent in operation and without moving parts is announced by the General Electric Co., Schenectady, N. Y.

The switch consists of two shallow chrome-steel cups, ¾-in. diameter, sealed together with a strip of lead glass to form a hollow compartment. Separating the cups is a disk of ceramic material having a small hole located near the edge. After assembly, this compartment is evacuated and four grams of mercury are inserted. This fills approximately one-quarter of the space. The compartment is then filled with hydrogen at about atmospheric pressure and sealed off by welding.

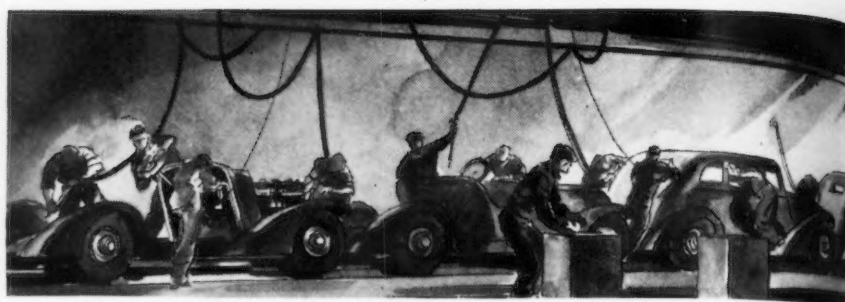
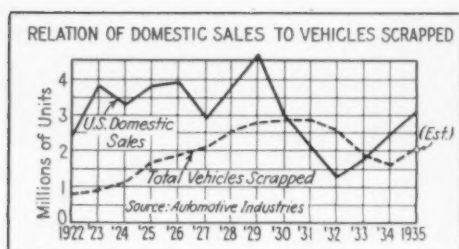
In the "off" position, the hole in the ceramic disk is above the mercury line. At rotation of 20 deg. the switch assumes a position which permits mercury to flow through the hole, thus establishing contact between the two chrome-steel cups, closing the circuit.

Hydrogen serves as a cooling agent and in quenching the arc. Heating is also controlled through a mercury-to-metal contact employing a mil of platinum on a tiny plate of steel, welded on the inside of each cup.

New Universal Vise

A NEW universal vise by the Covell Mfg. Co., Benton Harbor, Mich., provides that predetermined angles and clearances in both directions are to be produced accurately. The top part of the vise is fastened to a universal bracket with a T-slot bolt and can be moved, turned around, or be entirely removed quickly.

All surfaces are graduated in degrees. Angle adjustments are locked by hardened nuts. With steel jaws in position, capacity is 4 in.; without jaws 5 in. Jaws are 4½ in. wide, 1½ in. high. Base dimension, 4½ x 8¼ in. Weight 36 lb.



THIS WEEK ON THE

Auto Production Resumes Pace as Weather Moderates

had been anticipated the first of the year. It is understood that Chevrolet's schedules will be 50 per cent above those of February. Ford, after a few weeks' slow-up, is back on a five-day week basis and will probably operate at capacity with its present force. Briggs Mfg. Co., as a result of both Ford and Plymouth schedules, is back on a five-day week, after bumping along on two- and three-day-week schedules during February. All the Fisher Body units are again active and back on a five-day week. Chrysler's East Jefferson plant is about the only one in Detroit still operating on a three-day schedule.

Study Ice Hazards

The past month of extremely hard winter weather has taught the industry some lessons, and no doubt advantage will be taken next year in applying some recent developments to overcome the hazards of driving on ice-coated streets. The Beach Mfg. Co. of Charlotte, Mich., recently tried out its "chatter bump eliminator" on a city street covered with an 8-in. surface of hard-packed ice with deep ruts down the center. The machine, which was originally designed to eliminate the washboard effects from gravel roads, removed the ice in big cakes, leaving the pavement perfectly clear. Road engineers and city engineers have been hard pressed to eliminate ice conditions in the last month. In Detroit, literally hundreds of tons of salt were spread over the streets, which, if anything, acted as a further deterrent on car sales. Engineering authorities say, for example, that 50 hr. of exposure to concentrated salt spray is equivalent to about three years of normal weathering. Hence one cannot

accepting cars which dealers had ready for delivery. The owner was inclined to feel he would be taking a great risk even in driving his car back to the garage without a damaged fender from an untimely skid.

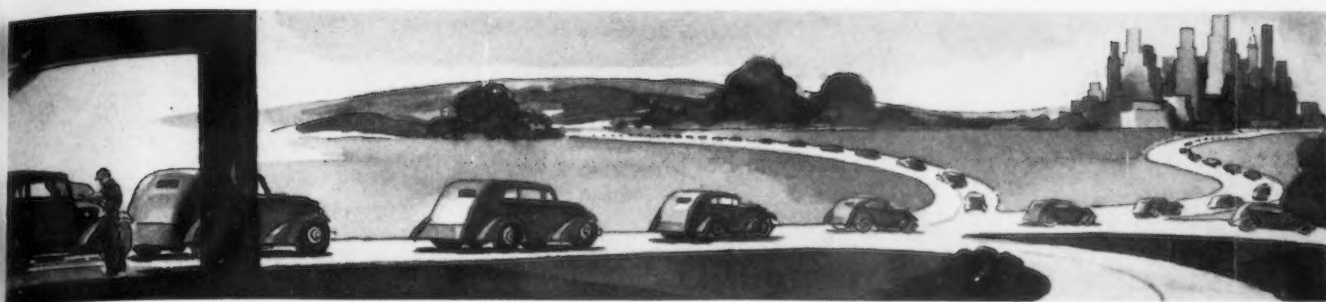
Dealers in Detroit report increased business both in new cars and used cars, partly because of the Feb. 29 deadline on 1936 license plates. Sales departments are already getting busy on spring drives. Buick, for example, launched a big spring sales offensive which will be marked by an increased advertising and sales promotion program. Both Buick and Packard have had regional sales meetings in the last week and both corporations report unmistakable signs of a "tremendous" spring business.

March Schedules Higher

Largely because the recent change in the weather has stimulated a momentary feeling of spring, the manufacturers have taken new hope and have set up their March schedules more in line with what

DETROIT, March 3.

A BREAK in the weather has meant a lot to the automobile manufacturers in the past week. The rise of temperature into the 50's temporarily caused floods throughout the country, but exposed the pavement for the first time in weeks and made it possible for cars to get rolling again. Here in Detroit a great deal of the temporary lull in production has been due to the inability to ship cars, particularly by the drive-away method. At the other end of the line, customers were not



ASSEMBLY LINE

By FRANK J. OLIVER

Detroit Editor, The Iron Age

blame the average motorist for not wanting to subject a brand new automobile to such an accelerated corrosion test.

The reduction in schedules in February has not only meant shortage of hours for workers in the automobile plants, but also a reduction of the number of workers. Figures as of Feb. 15 indicated that Detroit's industrial employment index had fallen in a month from a high of 109.2 to 101.1. In the same period, families on relief in Detroit increased from 17,165 to 19,091. WPA workers similarly have increased from 25,063 to 26,183. Now that the plants seem to be going again, a reversal of this trend is in order. Toledo, strangely enough, showed an increase in the number of its industrial workers from 13,266 to 16,001 for one week in the middle of February.

Ford Releases Steel

As yet, the steel industry has to see new automotive buying in any great quantities. Last week Ford released large tonnages of steel previously on order, and other makers have done the same. It is expected, however, that as present stores on hand are reduced by rapidly increasing operations, the automobile manufacturers will again enter the market in a big way.

Department of Commerce figures indicate that January production of passenger cars and trucks in the United States and Canada was 380,554 units, as compared with 421,579 in December. Cram's Reports estimate 64,956 units for the week ending Feb. 29, up several thousand units from the low point of 62,813 reached the week before. The estimated total for the month is 282,000 units.

Considerable activity is seen in the machinery industry for the next few months ahead, in preparation for 1937 models. Most of General Motors' units are actively in the market at the present time and it is expected that before long Chrysler will get started on an extensive rehabilitation program.

Machinery Programs Taking Shape

The money that is spent for machinery in the automotive industry runs into big figures. It is understood, for example, that Chrysler recently bought \$600,000 worth of machinery for cutting hypoid gears, to be installed at the Dodge main plant. New presses for the stamping division of General Motors in Grand Rapids ran close to \$2,000,000. Oldsmobile is soon to get started on a \$6,000,000 plant rehabilitation program, and Chevrolet will probably spend large sums for a new motor line at Flint. Chevrolet will stick to the six-cylinder design, but may possibly revert to the L-type head. Another company, yet unnamed, is said to have appropriated \$9,500,000 for new machinery.

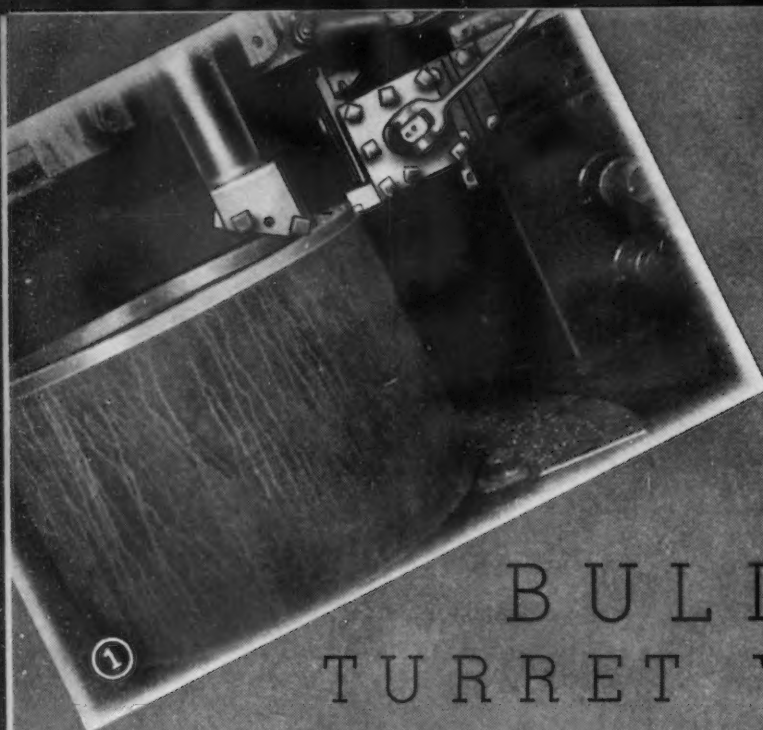
Charles F. Kettering, speaking in Chicago last week, indicated that if more money were spent on research throughout the country, factories would again have to put out "help wanted" signs. As if to swallow a bit of his own medicine, he is putting in several hundred thousands of dollars worth of modern equipment in the experimental machine shop in the General Motors Research Building in Detroit. Coincidentally, bids are being advertised for two additional floors on the same building to make it a 13-story structure.

Speaking of research, L. W. Wallace of the Association of Amer-

ican Railroads, in a speech at Pittsburgh last week, indicated that because of research the railroad industry stands on the threshold of one of the most active and fruitful eras in its history. Never in the history of the rail carriers, according to Mr. Wallace, has there been such an eagerness and alertness on the part of railroad executives, scientists and engineers to apply any new procedure that will enable the railroads to make available more economical, efficient and safe transportation. The day following this statement the ICC ordered a reduction in basic rail passenger fares from 3.6 to 2c. a mile. Reference to the railroad situation may seem out of place in these columns, if it were not for the fact that the principal competitors on passenger traffic have been the bus and the private automobile. Now that the railroads seem to have gotten over the worst of the depression, they seem to be in a more aggressive mood to recover some of the business lost to the highways.

Steel Prices Strengthening

Steel makers appear to be exhibiting a little strengthening of the vertebrae when it comes to considering a restoration of list prices beginning with the next quarter. As statement after statement comes out from the automobile and auto parts makers, it becomes increasingly evident that the industry as a whole made some real money in 1935. Thirteen leading automobile companies showed profits aggregating \$214,550,000, an increase of 123 per cent over the preceding year. With raw materials, principally scrap, rising at leaps and bounds, it is apparent that there will have to be a



BULLARD TURRET VERTICAL LATHE

Illustrations 1 & 2

L ring for Dunbar packing rings.

Cast Iron. Hunt-Spiller gun iron.

Operations: Rough and Finish, turn and bore tube.

$\frac{1}{8}$ inch depth of cut.

Machining time — 45 minutes.

Illustrations 3 & 4

Dunbar packing rings.

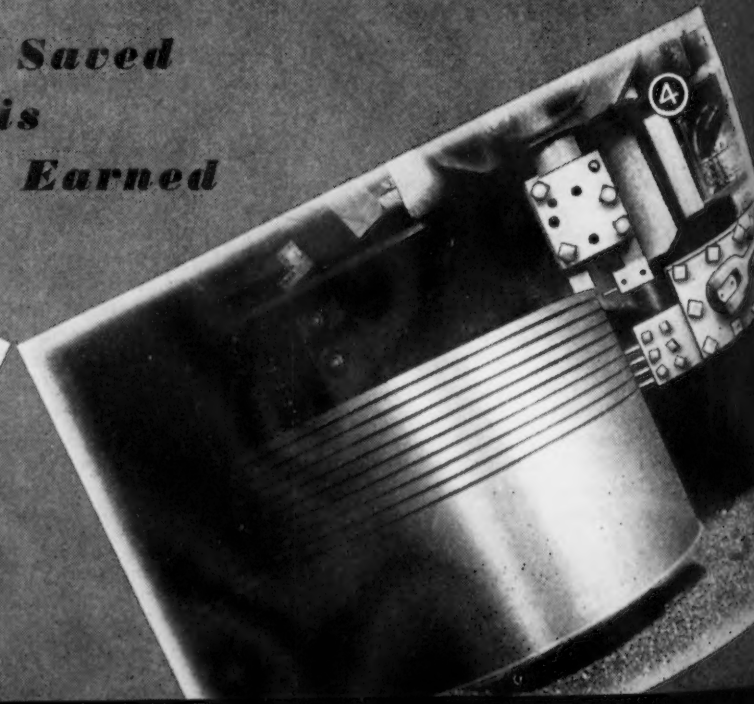
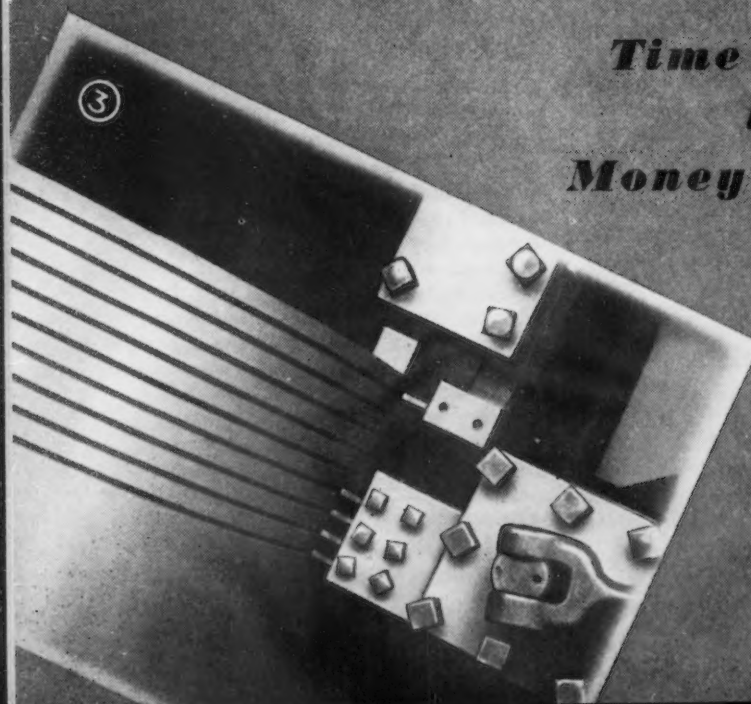
Hunt-Spiller gun iron.

Operations: Grooving and cut off.

From rough cast tube — 22 completed rings in 2 hours and 20 minutes.

THE BULLARD COMPANY
BRIDGEPORT CONNECTICUT

*Time Saved
is
Money Earned*



strengthening in the price situation if the steel companies wish to put themselves on an equal earning basis with one of their principal buyers.

Hudson Motor Car Co. showed net earnings of \$584,749 for 1935, compared with a net loss of over \$3,000,000 in 1934. Out of the operating profit of \$2,701,014 there was set aside \$1,714,503 for depreciation, plus interest charges. Hudson has shown a spectacular come-back after a depression low, and a great deal of the credit for this is attributed to the late Roy D. Chapin. A. Edward Barit, who has succeeded Mr. Chapin as president, however, has been very closely connected with the company since its organization in 1909, when he was employed as secretary to the purchasing agent. In recent years, as first vice-president, treasurer and general manager, he worked side by side with Mr. Chapin in the fields of finance, manufacture, sales, engineering and purchasing. He has probably as broad a knowledge of the automobile industry as any man in it, so that Hudson should continue to improve its position. As a result of its present situation, Hudson should be in the market for new machinery during the current year.

Studebaker's financial statement does not look nearly as good in comparison. According to the *Wall Street Journal*, the corporation is expected to show a net loss of approximately \$1,975,000 for the period from March 9, 1935 (at which time the company emerged from receivership), to December 31, 1935. Net losses in October and November, when the company was practically out of production and in which there were heavy expenses incident to the introduction of new models, more than offset a small net profit made in December. Small losses are expected on January and February shipments, but it is expected that the company will be definitely in the black in March. Studebaker sales in January were 6042 units and for the first 20 days in February 3562 units, indicating total sales in February of approximately 5300 units. At that, February sales for the period were 45 per cent ahead of the corresponding figures for 1935.

Willys-Overland Reorganizes

Willys-Overland Co. followed Studebaker out of receivership last week. David R. Wilson, who had been appointed as trustee of the company under Section 77-B of the Federal Bankruptcy Act, has been elected president. The factory is now working on an authorization of 15,000 cars. Production has

been running from 300 to 500 cars a week. The factory turned out 2884 cars in January and produced 21,341 cars in all of 1935. Willys-Overland is not out of the woods yet by a long shot, as a suit involving \$2,000,000 in delinquent bonds is still pending. Recent action has been taken as a step to

prevent forced liquidation of the company assets. It is hoped that the new set-up will put operations of the company on a more efficient and economical basis, principally because it will give Mr. Wilson a free hand in the purchase of supplies and the regulation of production.

Increase in British Pig Iron Production Still Fails to Meet Heavy Demand

LONDON, March 2 (By Cable).—

Pig iron production is increasing rapidly but demand still exceeds supply considerably. Moreover, all additional output is needed for steel works, therefore the market shortage is unrelieved. Five shillings premium is asked for deliveries of foundry or forge iron beyond June. Plans for increased output are being retarded by coke shortage. William Dixon's new Glasgow battery of 50 coke ovens will operate soon, permitting an additional annual pig iron output of 150,000 tons.

Demand for bars and billets is unaffected by the price advance and producers are fully booked for March and April, refusing orders for delivery before May. Makers

of shipbuilding steel are busy. There is a large volume of miscellaneous orders for building and engineering trades. Export business is livelier. Rhodesia has ordered 22,000 tons of railroad steel and further heavy inquiries for rails are circulating. Tin plates have substantial bookings for home trade and good export orders for delivery up to the end of the third quarter. Continental iron and steel market is satisfactory generally but some departments are weak, notably joists and thin sheets. Nederlandsche Hoogovens en Staalfabrieken is building new tube works, with an annual capacity of some 25,000 tons, to exploit the new process.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9	
Billets, open-hearth	£5 10s.	to £5 17s. 6d.
Tin plate, per base box	18s. 9d.	to 19s. 3½d.
Steel bars, open-hearth	£7 17½s.	
Beams, open-hearth	£7 12½s.	
Channels, open-hearth	£7 17½s.	
Angles, open-hearth	£7 12½s.	
Black sheets, No. 24 gage	£9 15s.	
Galvanized sheets, No. 24 gage	£11 15s.	

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas	£2 7s.	
Wire rods, No. 5 B.W.G.	£4 10s.	
Steel bars, merchant	£3 5s.	
Sheet bars	£2 8s.	
Plate, ¼ in. and up	£4 6s.	6d.
Plate, 3/16 in. and 5 mm.	£4 8s.	8d.
Sheets, ½ in.	£4 9s.	8d.
Beams, Thomas	£3 2s.	6d.
Angles (Basic)	£3 2s.	6d.
Hoops and strip base	£4 2s.	6d.
Wire, plain, No. 8	£5 7s.	6d.
Wire nails	£5 15s.	
Wire, barbed, 4 pt. No. 10 B.W.G.	£3 15s.	



THIS WEEK IN WASHINGTON

Opposition to anti-basing legislation grows in the Senate and its passage is now more doubtful.

□ ○ □

President's tax message dims ardor of Congress for doling out cash.

○ ○ ○

Sponsors of 30-hr. week legislation admit it won't pass at this session of Congress.

○ ○ ○

Electrical manufacturers propose trade practice rules to Federal Trade Commission.

○ ○ ○

Business advisory council announces comprehensive program.

○ ○ ○
BY L. W. MOFFETT

Resident Washington Editor,
The Iron Age

○ ○ ○

WASHINGTON, March 3.—Opposition within the Senate Committee on Interstate Commerce to the Wheeler-Utterbach anti-basing point bill is reported to have a great deal of strength. . . . In some quarters it is believed to be sufficient to prevent the bill from being reported to the Senate. . . . There is said to be even less likelihood of its being reported out by the House Committee on Judiciary. . . . In any event the latter probably will not act on the measure until after the Senate committee has acted. . . . Should this estimate of the situation prove accurate, it would obviously mean that legislation on the subject would be improbable at the present session of Congress. . . . On the other hand, if the bill reaches the floors of both branches of Congress, it is believed it will readily be passed. . . . It would then become a question of White House action. . . .

Chairman Wheeler of the Senate

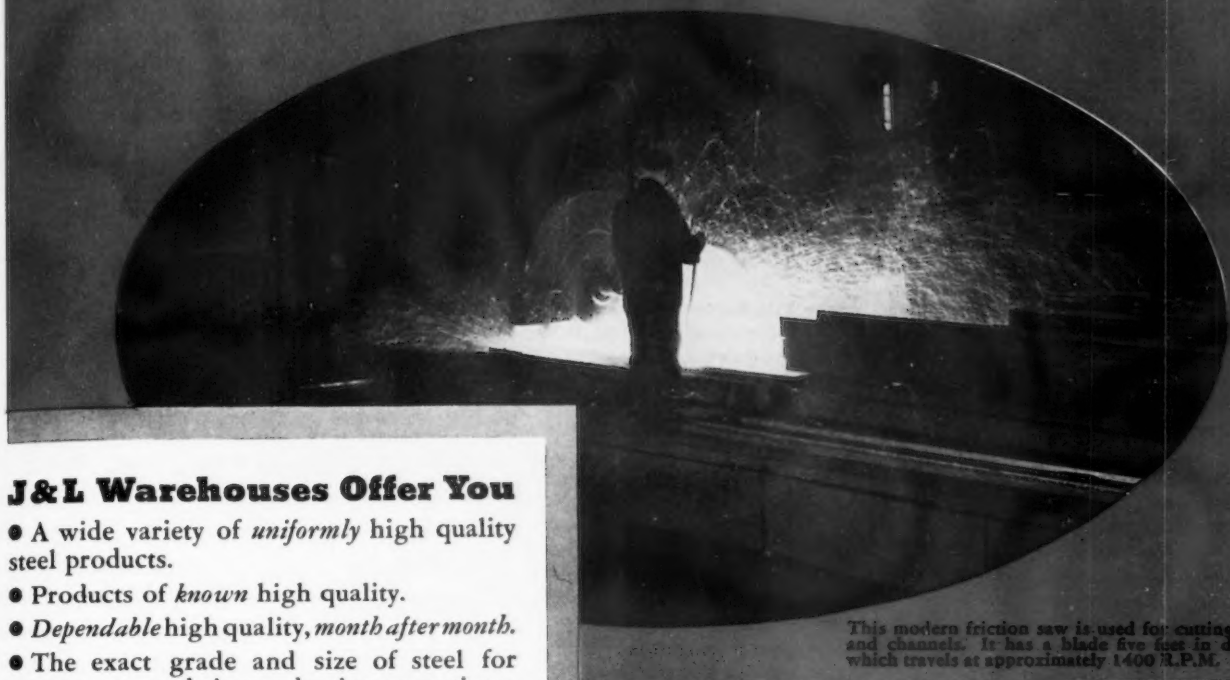
Committee on Interstate Commerce has announced that hearings on the antibasing point bill will be begun on March 9 before the full committee at room 412 Senate Office Building. Senator Wheeler will preside at the hearings.

The President has never gone on record publicly on the question. . . . During the code period he had an investigation made of the steel basing point system. . . . He ordered a joint study by the Federal Trade Commission and the National Recovery Administration. . . . These two Government bodies were unable to agree on procedure. . . . The upshot was that each made its own investigation. . . . They submitted separate voluminous reports to the President. . . . The FTC stood fast in its traditional stand for abolition of the prevailing multiple basing point system and substitution of an f. o. b. mill system. . . . The NRA recommended a group-mill basing point system. . . . The President, so far as is known, has not acted on recommendations made in either of the two reports. . . . There is no surface evidence that the Wheeler-Utterbach bill has

White House approval, or disapproval, for that matter. . . . The mere fact that the bill undoubtedly has FTC sanction, if not sponsorship, is not accepted as an indication of the White House attitude, if indeed the White House has taken a position on the matter. . . . The FTC, however, does stand in strong favor with the White House. . . . This latter fact might or might not be an important factor in getting Presidential approval of the Wheeler-Utterbach bill, were it to reach the White House. . . .

The opposition to the measure in the Senate committee is said to come from members whose States would be vitally affected by its enactment. . . . Industries concerned have previously opposed such legislation. . . . Not alone has steel, but the lumber, cement, sugar and other industries operating under a basing point or similar system of quoting prices have consistently objected to such legislation and have endeavored to point out that a change in the system would be inconvenient and would work harm to them without providing benefits for consumers. . . . In fact, many

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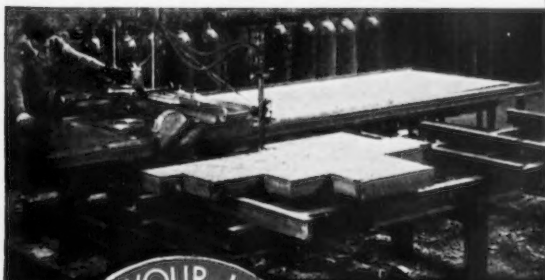


This modern friction saw is used for cutting beams and channels. It has a blade five feet in diameter which travels at approximately 1400 R.P.M.

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- A wide variety of *uniformly* high quality steel products.
- Products of *known* high quality.
- *Dependable* high quality, *month after month*.
- The exact grade and size of steel for emergency needs in production operations.
- Steel products in ready-for-use form.
- Complete facilities for cutting, forming, and welding steel for all your maintenance requirements.
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- Knowledge and experience gained through more than eight decades of manufacturing iron and steel.
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- Services that are fast and complete.

Flame cutting machine used for cutting odd shapes from plates of any thickness. Cut is accurate and edges are clean.



Each J & L Warehouse is an integral part of the Jones & Laughlin Steel Corporation, offering a wide variety of steel products and services that mean worthwhile savings to steel users in every industry.

For example, your J & L Warehouse offers you important savings in furnishing steel for your maintenance requirements. Modern equipment for providing steel in ready-for-use form saves you time, trouble and money. Hundreds of manufacturers depend on these facilities to cut odd shapes from plates to replace broken castings and forgings; form, machine, or mill bars; do accurate punching or shearing; assemble steel plates and shapes by riveting or welding, etc. This service is a very important part of the complete *local* services offered by your J & L Warehouse—services that are *fast and dependable*.

J & L Warehouses in Cincinnati, Chicago, Detroit, New Orleans and Pittsburgh carry complete and diversified stocks of steel products to meet all your requirements. Order from the one nearest to you.

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AMERICAN IRON AND STEEL WORKS



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NEW YORK (Long Island City)—Investide 6-8700 ... Operated by National Bridge Works Division of Jones & Laughlin Steel Service, Inc.
LOUISVILLE—Magnolia 1693 ... Stock of Bars for Concrete Reinforcements and Bar Fabricating Yard

Memphis—6-4836 ... Distributing Warehouse for Pipe, Sheets, Spikes and Wire Products. Reinforcing Bar Warehouse and Fabricating Shop

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STEEL**

For Every Need ... the
Right Quality of Steel
in a Full Range of Sizes

consumers themselves have expressed opposition to such legislation. . . . The situation, as it applies to the Senate committee, is also true of the House committee. The majority of the former, however, is held to be more "liberal" than the majority of the House committee. . . . For that reason, especial interest is directed toward action by the Senate committee. . . .

Another element which is being taken into consideration is the fact that the Administration clearly is once more, temporarily or otherwise, leaning toward the right. . . . Having in mind that it is a campaign year, it has let up somewhat on attacks on business and industry. . . . It is now trying to cultivate a better feeling in business and industry. . . . Some of the New Deal satellites, in engaging in this endeavor, are trying to emphasize their claim that it is only the "greedy minority" which is opposed to the New Deal, knowing, however, that business sentiment against the Administration runs extremely strong. . . . In any case, the strategy of the Administration at present would indicate it will not sponsor business-baiting legislation. . . . It is realized, of course, that such legislation would be readily urged if it were considered politically beneficial. . . . So the question is determined on that of expediency. . . .

Moreover, the Administration affects to want Congress to confine itself to as little legislation as possible in order that adjournment may be speeded, to be followed by accelerated political ballyhoo on the stump and before the microphone and by the printed word. . . . Included in this legislation will be more taxation than Congress had counted on. . . . With the vote getting in view, it was lavish in spending taxpayers' money for the bonus, the farmer, and other groups and was hoping the day of reckoning could be postponed till after election. . . . But now it is facing a White House demand for means to pay part of the costs other than that involved in farm legislation, the latter Administration-inspired, and incidentally, a mere subterfuge to last until after election. . . . For among its supporters it is conceded the new "soil conservation" legislation is even more unconstitutional than the now defunct AAA. . . .

Meanwhile, whether or not a moratorium is declared on business-baiting legislation, industry is rather distantly removed from the blessings of a breathing spell, as the iron and steel group knows. . . . Just now, it is being pestered with orders from the National Labor Relations Board, the FTC is continuing its Ickes-inspired inves-

tigation of so-called "collusive bidding" on sheet piling for PWA projects, and organized labor, split within its own ranks, is preparing to make a two-headed "drive" to organize the industry. . . .

An investigator for the FTC was in New York last week in connection with the so-called "collusive" bidding inquiry which was ordered by the President. . . . It is understood that the investigation is nearing an end and that a report will be made to the White House comparatively soon. . . .

A.F. of L. Split Continues

The two forces within the American Federation of Labor which have announced determination to organize the steel industry appear to be in a race with each other and what may happen when the twain meets remains to be seen. . . . Sponsoring the orthodox craft policy, President Green of the Federation has said he will begin its organization campaign this spring, working evidently through the Amalgamated Association of Iron, Steel and Tin Workers. . . . That he proposes to provide funds for the campaign is evidenced from his statement that he is working out a budget for that purpose. . . .

Sharply opposing the craft union movement is the Industrial Committee for Organization, headed by John L. Lewis, president of the United Mine Workers of America, who says the committee will organize the steel and other mass industries on a vertical basis. . . . He has stated that the committee will work within the A. F. of L., if it can. . . . If it can't, then it will work outside of it, defection or no defection. . . . Craft unionists, dominating A. F. of L., are extremely hostile to the industrial union move as shown by the fact that President Green has flatly turned down the offer of \$500,000 by the industrial committee to organize the steel industry, provided the money is used to organize the industry vertically. . . .

Mr. Green has transmitted the proposal to the Federation's executive council, whose decision will be final. . . . And its decision, no doubt, will be to confirm the action of President Green. . . . Craft unions in the steel industry insist that if Mr. Lewis is so keen for industrial unionism he should be willing to surrender to them the miners in captive coal mines owned by steel companies. . . . Mr. Lewis, of course, will make no such "surrender." . . . And steel craft unions firmly state they will not surrender their membership to an industrial union. . . . So the tug of war be-

tween the industrial and the craft unionists appears to have already started. . . .

Tariff Policies Contradict

Obsessed though it is with the idea of low tariff duties, as indicated by reciprocal tariff agreements, the "Administration has just made a sharp increase in duties on wool knit gloves and mittens, whose importations from Japan were raising hob with the domestic industry. . . . The increase was made through a change in the basis of assessing duties from a foreign value to the domestic value. . . . The President proclaimed the new duty as the result of a report of the Tariff Commission, made in response to a Senate resolution. . . . The commission's investigation showed that the excess of the domestic over foreign (Japanese) costs could not be equalized by increasing the ad valorem part of the duty (40c. per lb. and 35 per cent ad valorem based on foreign value) when calculated on the foreign value, to allowable maximum increase of 50 per cent of the existing rate. . . . It was therefore mandatory to change the base for the ad valorem duty from the foreign value to selling price of similar domestic articles. . . . The inroads of the cheaply produced Japanese imports are shown by the fact in 1935 they constituted 95 per cent of total incoming shipments of 527,000 dozen pairs and the latter in turn were equal to 73 per cent of the domestic production of 715,000 dozen pairs. . . .

The State Department, however, is proceeding eagerly with its reciprocal tariff agreements, though the happy results hoped for have not developed. . . . Ten have been negotiated, seven are under negotiation and a number of countries are declared to be on the waiting list, ready enough to swap one dollar for two dollars. . . . Bills to repeal or amend the reciprocal tariff act are numerous. . . . And they'll get exactly nowhere under the New Deal. . . . Nevertheless, as shown by its action in the case of imports from Japan of textile products, it is confronted with the anomalous possibility of raising some of the despised Hawley-Smoot duties. . . .

30-Hr. Week Bill Killed

Representative Connery, Democrat of Massachusetts, lusty crusader the past five years for shorter hours in industry, has confirmed reports of the death of his 30-hr. week bill—for this session.

... But he looks hopefully to its resurrection. . . . "It doesn't look good for this year, but it will go through flying as soon as we get back next year if President Roosevelt is reelected," said Mr. Connery, who has previously made some very bad predictions about passage of the measure. . . . The trouble, it seems, is that the candidates for reelection are jittery. . . .

"Because it's election year, it will be hard to get leaders to go along," Mr. Connery pointed out. . . . Which is perhaps as good a way out as any other. . . . The inference is that both the President and a majority of Congress would like to swat industry with the 30-hr. bill but, for political reasons, are withholding the club and will crack down if reelected. . . . It is easy to believe that this represents the attitude of a majority of Congress, partially because the bill once passed the Senate where it was sponsored by Senator Black of Alabama. . . . As to the President, he has never indicated that he favors the bill, despite backing given it by the American Federation of Labor. . . . On the contrary, it is seriously doubted that the President would support it. . . . And it may be added that it is strongly suspected that a large section of the American Federation of Labor, aware of its unsoundness, has supported the measure only by giving it lip service. . . .

Business Advisory Council Program Announced

At the completion of the regular meeting of the Business Advisory Council for the Department of Commerce, Secretary Roper announced last Thursday that among the problems which the Council has under consideration are the following:

The question of appropriate legislation concerning the merchant marine;

Problems arising for business and the Department of Commerce through the administration of the Social Security Act;

The operation of the reciprocal trade agreements and other foreign trade problems;

Government cooperation in the relocation of industries;

The needs of the Department of Commerce for scientific research through the facilities of the Bureau of Standards;

The need for the creation of a National Economic Council;

Simplification of patent procedure, through establishment of a single court of appeals supplied with adequate scientific and technical advice;

Disposition of the NRA records and studies and salvaging of assets.

Among Council members in attendance were: Edward P. Stet-

inius, chairman, finance committee, United States Steel Corp., New York; Ralph E. Flanders, president, Jones & Lamson Machine Co., Springfield, Vt.; Rolland J. Hamilton, president, American Radiator Co., New York; F. B. Adams, chairman, Air Reduction Co., New York; William C. Dickerman, president, American Locomotive Co., New York, and Gano Dunn, president, J. G. White Engineering Corp., New York.

Electrical Manufacturers Propose Trade Practice Rules

The National Electrical Manufacturers' Association has made application to the Federal Trade Commission for the adoption of trade practice rules and a conference has been announced, the date to be determined later. According to the FTC, the association, with a membership of about 400, represents approximately 86 per cent of the total volume of sales of the industry. The industry employs about 400,000 workers, has a capital investment of approximately \$850,000,000 and total sales of about \$650,000,000.

Among the subjects to be considered at the conference are: Unfair discrimination in price among customers; false marking or branding of products of the industry tending to deceive purchasers; false, untrue or deceptive advertising of products; secret payment or allowance of rebates, refunds or unearned commissions, credits or discounts; defamation of competitors, willfully inducing or attempting to induce breach of existing contracts; improper use of price lists; limitation of trademarks, trade names or other marks of identification of competitors; commercial bribery, and other practices usually considered at trade practice conferences sponsored by the commission.

Watch Effect of Passenger Fare Cut on Equipment Purchases

The effect of the Interstate Commerce Commission five-to-four decision ordering reductions in passenger and Pullman rates is being awaited with interest. The new rates, to become nation-wide June 2, in the opinion of the majority of the commission will stimulate railroad passenger travel. They presented figures showing this had been the result of lowered rates already prevailing on Southern and Western lines.

In the event such a stimulation develops, it is assumed the carriers will find it necessary to buy addi-

tional new and modern passenger equipment. On the other hand, since the reduced rates are held to put railroads on a more sharply competitive basis with automobiles and motor buses, it has been contended that demand for motor equipment might be expected to decline. Railroads in the East were generally hostile to a reduction, the two outstanding exceptions being the Baltimore & Ohio and the Reading railroads. The decision was followed by reports that the decision might be contested in the courts. President M. W. Clement of the Pennsylvania Railroad said that the decision will have "a serious effect" on his line.

The commission ordered a reduction in passenger fares to 2c. a mile in day coaches and 3c. in Pullman coaches. Pullman surcharges were ordered eliminated.

Jones & Laughlin Files Loan Application With SEC

The Jones & Laughlin Steel Corp. has filed an application with the Securities Exchange Commission for authority to register an issue of \$40,000,000 in first mortgage 25-year bonds, of which \$31,500,000 will be used to finance the construction of new equipment. For the immediate construction at the Pittsburgh works of a continuous wide strip-sheet plant and additional generating capacity, \$25,000,000 will be spent. An additional \$5,000,000 will be used to cover expenditures already made and to be made for the construction of a new 44-in., electrically driven blooming mill at the Pittsburgh works. At the Aliquippa works \$1,500,000 will be spent to cover expenditures already made and to be made for construction of additions and improvements to the four-high cold reducing mill. For the discharge of indebtedness to the Union Trust Co., Pittsburgh, \$5,500,000 will be used and the remainder will be for corporate purposes.

The Jones & Laughlin registration is the largest new money issue filed with the Securities Commission up to date.

Speaking of the plant to be built at the Pittsburgh works, the corporation said:

"This plant will add new lines of products for sale to the trade. In addition it will produce light plates of better quality and finish than those now being rolled on both the sheared and universal plate mills at the Pittsburgh works . . . and at a considerable saving in cost. These new facilities for the production of light plates should

prove an important factor in the operations . . . as light plates rolled on the present plate mills cannot be sold competitively. The new plant will also supply the tin plate department of the Aliquippa works with light-weight hot-rolled strip coils. It is expected that a considerable saving will be effected by the use of these light-weight hot strip coils in place of the heavy strip coils formerly produced on the 45-in. universal mill at the Pittsburgh works . . . and in place of the light-weight hot-rolled coils now temporarily being produced by an independent manufacturer from slabs furnished by the registrant. Furthermore, wide skelp may be produced by the new mill for the pipe mills of the Aliquippa works and, when desirable, for sale to the trade.

"No attempt is made herein to estimate the effect on the business of the registrant and its subsidiaries of statutory enactments and regulations thereunder, of changes in tariffs, economic conditions, technique of manufacturing steel products, industrial practices affecting the use of steel, taxation and other conditions, some of which may have an important bearing on the operations and earnings of the registrant and its subsidiaries."

Ludlum Steel Files Registration Under Securities Act

The Ludlum Steel Co., Watervliet, N. Y., has filed a registration statement with the Securities and Exchange Commission covering a maximum of 260,765 shares of \$1 par value common stock, and rights to subscribe such stock. The company plans to offer its common stockholders of record at the close of business on April 2, 1936, rights to subscribe on a pro rata basis, at \$22 per share of 42,250 shares of \$1 par value common stock, now authorized but unissued.

The company further plans to call for redemption, at \$110 per share plus accrued dividends, its outstanding preferred stock, to be effective simultaneously with this registration statement, the redemption date to be the forty-sixth day thereafter.

The net proceeds of the issue of 42,250 shares are to be used as follows:

Payment of balance of bank loan, \$149,728.28.

Approximately \$450,000 to be used to reimburse company's treasury for capital improvements made out of earnings during five years preceding Dec. 31, 1935.

Balance, approximately \$279,-

500, to be used for working capital.

The net proceeds from the sale of 218,515 shares are to be used to reimburse the treasury for payments made to redeem outstanding preferred stock.

Berry Council Meets March 12

Industry Coordinator George L. Berry has announced that the Council for Industrial Progress will meet in Washington March 12 when it will receive reports from seven committees. Major Berry said the reports will relate to such subjects as wages, hours and the anti-trust laws. It is also understood that one report will recommend that a permanent Industry-Labor "legislature" be set up, to be operated "independently" of the government, except that funds would come from the Federal treasury for the establishing and maintaining of headquarters for the "legislature."

Contends Wide Departure from Code Standards

Contending that there has been a widespread departure from NRA code standards, Representative Arthur D. Healey, of Massachusetts, a member of the subcommittee on Judiciary, which has been considering the legislation, yesterday introduced a substitute for the Walsh government contract bill which passed the Senate at the previous session of Congress. The Healey bill is proposed as permanent legislation whereas the Walsh bill was limited to two years.

The Healey bill, while providing for minimum wages and maximum hours, is less drastic than was the

Walsh measure. Affecting all federal government contracts involving \$2000 or more, the Healey bill eliminates the retroactive feature of the Walsh bill which required that materials and services must have been provided under codes standards. Under the Healey bill this requirement only applies to the production of materials and services after the measure has become a law. The Healey bill also requires that contractors simply give notice to subcontractors that supplies are to be produced under code standards. Unlike the Walsh bill it does not hold general contractors responsible beyond giving such notice. The Healey bill also omits reference to contractors using government loans or grants. Instead it limits application of the proposed standards to contracts between the federal government and the general contractor and does not extend to contracts performed for states and other political subdivisions with the use of federal funds.

In providing for wage and hour standards, the Healey bill also omits all references to codes. Instead it adopts the language of the uniform model state minimum wage act. Administration of the proposed law would be given to the Department of Labor. It would be authorized to grant exemptions where injustices would be done by requiring strict adherence to the provisions of the act. It carries the same penalties as those provided in the Walsh bill.

Mr. Healey declared that it is imperative to pass the legislation at this session so as to prevent gains under NRA codes "from being entirely wiped out." Hearings will be held before the House subcommittee on Judiciary some time this month.

President's Tax Program Arouses Consternation Among Politicians

WASHINGTON, March 3.—Shaken deeply by the enormous tax program put up to it by the President, Congress now faces the inevitable and difficult task of raising money which it has so freely spent or authorized on an unparalleled scale of prodigality during peace-time. Readily yielding to Administration demands for huge appropriations, Congress is confronted with the bitter realization that it is infinitely easier to squander money than it is to raise it. This being an

election year, it had hoped to escape further tax legislation until after the election. Not only are Administration supporters gravely disturbed over the tax program thrust before them because of its possible effect on their political future, but are also embarrassed because the President's tax message provided no recommendations as to the means of raising taxes.

The program, as has been outlined, involves an additional estimated outlay of \$1,120,000,000 which the President said is needed

to take care of the cash bonus amortization, the new farm legislation and reimbursement of the Treasury for processing taxes which the Supreme Court knocked out when it held the AAA was unconstitutional. Over and above these taxes Congress must provide a relief appropriation which, it is estimated, will total about \$2,000,000,000. Adding further to the disturbing situation is the March financing program of the Treasury calling for a loan of \$1,809,000,000, an all-time peace record, for relief, farm and bonus payments. This borrowing will bring the gross national debt to \$31,300,000,000, the greatest in the history of the United States.

Figures Only Estimates

With regard to the taxation, the President said that the figures given were round number estimates and that the actual estimated need is \$1,137,000,000. While it has been stated that it will be necessary to raise at least \$786,000,000 a year in new taxes for the next three years and \$620,000,000 annually thereafter, it is doubted that Congress actually will provide for such a large sum yearly for the next three years. Likewise it is doubted that the Administration contemplates the raising of this great amount. There is no adequate way of knowing what sum will be provided, since Congress itself has no definite views, but it is generally believed that the total to be raised by impending taxation will not exceed \$650,000,000. Actual estimates will not be prepared until after hearings which will begin soon before the House Committee on Ways and Means. Initial estimates will come from the Treasury Department. The figure of \$650,000,000 is made up of \$530,000,000 estimated to cover agricultural processing tax reimbursements and \$120,000,000 for bonus amortization, to continue over a period of nine years. Also, \$500,000,000 has been proposed as a permanent substitute for processing taxes.

But it is evidently hoped that \$150,000,000 in impounded processing taxes which the President has called a "windfall" can be recovered, or at least this suggestion has been put forward even in the face of the Supreme Court decision. The view is not shared generally. It is also believed that the actual amount of taxes to be provided at the present session of Congress will depend on income tax returns March 15. In some quarters it is thought that the estimated tax requirements have been purposely placed at an excessive level in anticipation of scaling it down on

the basis that the income yield has been greater than was expected. Those who look for such a move contend that it would be a good political gesture, though there are also those who think such strategy would be so transparent that it would be greatly discounted.

Taxes at Minimum

In any event it is clear that leaders in Congress will seek to hold new taxes to a minimum. The figures given out by the President at a press conference last Friday are much greater than those which are said to have been presented by him previously at conferences with a delegation from Congress and for that reason created consternation. Predictions were made that Congress would decline to enact legislation calling for so great sums as were submitted. Chairman Doughton of the House Committee on Ways and Means, obviously concerned over the situation, said he had supposed something besides processing taxes must be provided but that he still hoped the main part of the revenue could be raised in this way. It was hoped to avoid bonus taxation. Significantly, he added that the House might decrease the amount of taxes requested in the bill. Hearings, he said, probably will last 10 days or two weeks. A week or two, he stated, will be required to write the bill. Chairman Harrison of the Senate Committee on Finance said he did not expect any difficulty in enacting the bill, which, he stated, would be considered "in a wise and constructive way, without affecting the progress and upturn of business."

Fearful of Effects on Business

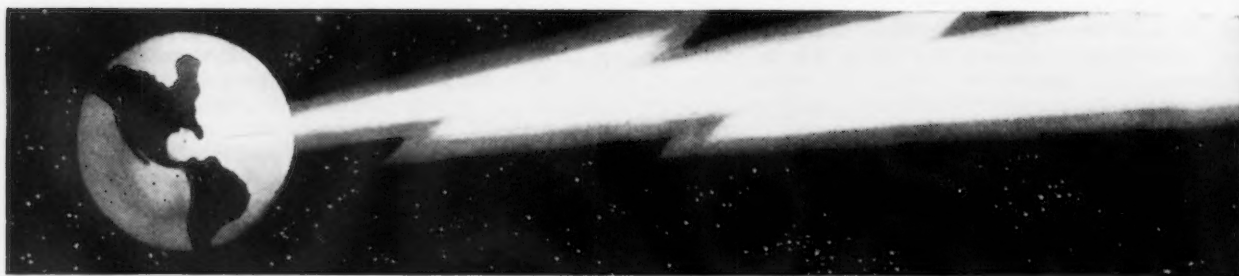
Nevertheless, Congress is fearful of the effect of the legislation on business, which, through different organizations and individuals will appear at tax hearings. At the same time it is the feeling of at least some sections of industry that the tax program will be wholesome. They base this view on the fact that it will have a strong influence toward stopping the spending orgy. They think it will bring to the end plans for further huge appropriations being asked by some of the alphabetical agencies. Likewise, it is believed that plans for raising revenue by taxation will head off the inflationary movement. This despite the fact that the tax program encouraged inflationists to renew their drive to start the printing press.

Speaker Byrns said that the inflation move would get nowhere and this is the prevailing sentiment in Congress.

Mr. Byrns has endorsed a tax on undistributed corporation profits and has said that many members of the Committee on Ways and Means are in agreement with him. However, there is doubt that such a tax will be levied because of the depressing effect it would have on business which the Administration is eager to see progress further toward recovery. Instead of this sort of levy predictions are made that a more probable levy is some form of excess profits tax designed to include corporations which have been granted Treasury refunds. The actual rates of such taxes apparently are considered to remain unchanged.

Increased talk also is heard of a general manufacturers' sales tax. The Administration in the past, however, has frowned on such a tax. Whether it has changed its mind on the subject is not known. Treasury experts have been exploring many methods of increased taxation, and without making recommendations, are expected to lay them before the Ways and Means and Finance Committees. One proposal is said to call for broadening of the income tax base, reaching down to low incomes. Even as low as \$750 for single persons is said to have been considered. Raising of normal taxes on small incomes and of surtaxes now applying in the lower brackets is also said to have been considered. The broadening of the base has been urged by few members of Congress, including Senator LaFollette of Wisconsin and Senator Byrd of Virginia. However, it is not believed Congress will even consider such a proposal, feeling that it would be political dynamite. The desperate need for revenue has undoubtedly turned some members toward the view that something in the way of "soaking the poor" will be extremely difficult to avoid even in the way of direct taxation. They realize it is inevitable by means of "hidden" or indirect taxes. They also are aware that "soaking the rich" is no longer a prospect since this program was exhausted at the previous session.

Manufacturers have taken a lesson from the automotive industry in proving the importance of style appeal, according to Don D. Smith, of the Briggs Mfg. Co., Detroit, in an address before 200 employees of the Noland Co., Briggs distributors in Richmond, Va. He described the transition of bath rooms, kitchens, refrigerators, washing machines and other equipment to things of beauty in design and color.



NEWS OF THE WEEK

Foundrymen Announce Program for Detroit Convention

AMERICAN FOUNDRYMEN'S ASSOCIATION has announced the following tentative schedule of sessions for its fortieth annual convention, which will be held at Convention Hall, Detroit, May 5 to 9, in connection with the foundry and allied industries exhibition.

The program is as follows:

- Monday, May 4**
Registration — Convention Hall
Plant Visitation
- Tuesday, May 5**
9:00 A.M. Exhibits Open — Close at 6:00 P.M.
9:00 A.M. Cast Iron Shop Course (Session 1)
10:00 A.M. Formal Opening Meeting—Fortieth Annual Convention
11:00 A.M. (a) Nonferrous Casting Practice
(b) Malleable Cast Iron
2:00 P.M. Sand Research
4:00 P.M. Sand Control Shop Course (Session 1)
7:00 P.M. Joint A.F.A., F.E.M.A. and Detroit chapter of A.F.A. Dinner, Smoker and Entertainment
- Wednesday, May 6**
9:00 A.M. Exhibits Open — Close at 6:00 P.M.
9:00 A.M. Cast Iron Shop Course (Session 2)
10:00 A.M. (a) Cast Iron
(b) Malleable Cast Iron Foundry Sand Control
12:30 P.M. Engineering Instructors Luncheon
4:00 P.M. Sand Control Shop Course (Session 2)
7:00 P.M. Dinner and Round Table Discussion — Nonferrous Division
8:00 P.M. (a) Foundry Refractories
(b) Apprentice Training
- Thursday, May 7**
9:00 A.M. Exhibits Open — Close at 6:00 P.M.

- 9:00 A.M. Cast Iron Shop Course (Session 3)
10:00 A.M. (a) Cast Iron Metallurgy
(b) Nonferrous Castings
12:30 P.M. (a) Steel Foundry Round Table Luncheon
(b) Malleable Round Table Luncheon
4:00 P.M. (a) Sand Control Shop Course (Session 3)
(b) Annual Business Meeting
7:00 P.M. Annual A.F.A. Dinner

- Friday, May 8**
9:00 A.M. Exhibits Open—Close at 6:00 P.M.
9:00 A.M. Cast Iron Shop Course (Session 4)
10:00 A.M. (a) Steel Founding
(b) Cast Iron (Alloy Cast Iron Symposium)
2:30 P.M. Symposium on Progress of Engineering, Medical and Legislative Aspects of Safety and Hygiene in the Foundry Industry
4:00 P.M. Sand Shop Course (Session 4)

- Saturday, May 9**
Exhibits—9:00 A.M. to 4:00 P.M.

hours per man with consequently larger pay envelopes. This looked-for increase in purchasing power will help the whole business picture, he concluded.

Plan Closer Employee Relations with Management

A PLAN for bringing plant employees in close contact with the high executives in discussing problems of industrial relationship under the employment representation plan has been adopted by the American Steel & Wire Co. Carrying out this further development of industrial relationships a joint convention of employee representatives and the management executives, including the president of the company and other high officers, will be held in Cleveland continuing three days, March 18 to 20.

Shortly after the inauguration of the plan of employee representation about three years ago district councils of employee representatives were formed to correspond with the district divisions of the company. The employees council of each plant of the district elects two delegates to meet periodically with the district management to discuss matters of interest to employees and to the company. These councils have provided employees with information from a district point of view.

The next logical step in the development of employee representation which is now being taken is to bring the employees' representatives, two from each plant, and high executives together in a joint convention. With 18 plants there will be 36 employee representatives in attendance at this meeting. This convention will function the same as the meeting of the district coun-

E. G. Grace Sees Better Outlook

IN a letter to Bethlehem employees appearing in the March issue of *Bethlehem Review*, Eugene G. Grace, president, stated that "the present situation of our company gives reason for a fuller degree of encouragement than has existed for several years past." Mr. Grace referred to the company's payroll of about 70,000 persons, and added that employment is now back to normal and that additional business, which can confidently be expected, will give more working



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● *Big Trucks—Capable Trucks—Dependable Trucks:* Elwell-Parker builds them for handling all kinds of loads in steel mills (including large flat sheets on forks, as shown above) and in the heaviest pressing and other metals-working operations where normal loads average 20 to 25 tons, or even more.

When the mills first began delivering strip steel in coils, Elwell-Parker was ready with Ram Trucks of correct design, with mechanical features demonstrated under actual conditions. Width and diameter have multiplied the weight

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The Elwell-Parker Electric Company, 4225 St. Clair Avenue, Cleveland, Ohio.

New **ELWELL-PARKER** *Trucks*

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cils in that a portion of the time will be devoted to sessions attended by employee representatives only and the remainder by joint sessions between the management and employee representatives.

To Discuss Low-Alloy Steels

LOW-ALLOY, high-tensile steels will be the topic at the regular monthly meeting of the New York section of the American Welding Society, to be held Tuesday evening, March 10, at the Engineering Societies Building, New York. Speakers will include A. B. Kinzel, chief metallurgist, Union Carbide & Carbon Research Laboratories, and H. M. Priest, engineer, railroad research bureau, subsidiary manufacturing companies, United States Steel Corp.

Summer Engineering Classes to Be Held

THE Society for the promotion of Engineering Education has accepted the invitation of Stevens Institute of Technology to hold a summer session on the economics of engineering at the Stevens Engineering Camp, Johnsonburg, N. J., during the week of June 28, immediately following the forty-fourth annual meeting of the society at Madison, Wis.

The committee appointed to arrange the program of the session consists of: O. W. Eshbach, American Telephone & Telegraph Co., chairman, Prof. Walter Rautenstrauch, Columbia University, President Harvey N. Davis of Stevens Institute of Technology, President A. R. Cullimore, Newark College of Engineering, Dean R. A. Seaton, Kansas State College, Prof. E. L. Grant, Stanford University, Prof. J. W. Roe, New York University, Dean Dexter S. Kimball, Cornell University, Prof. H. P. Hammond, Brooklyn Polytechnic Institute, and Prof. P. T. Norton, Virginia Polytechnic Institute.

The United States Steel Corp. will have a large display at the Great Lakes Exposition, Cleveland, June 27-Oct. 4, having taken 4000 sq. ft. of exhibit space. The American Rolling Mill Co. has also been added to the list of steel companies which will have displays at the exposition.

Birmingham Foundry and Engineering Meeting Was Well Attended

MORE than 400 engineers and foundrymen attended the fourth joint foundry practice meeting of the Birmingham section of the American Society of Mechanical Engineers, and the American Foundrymen's Association held in Birmingham Feb. 27 and 28.

A Birmingham district chapter of the American Foundrymen's Association was organized with the following officers: Chairman, Lester N. Shannon, vice-president, Stockham Pipe Fittings Co.; vice-chairman, W. Lee Rouche, McWane Cast Iron Pipe Co.; secretary, treasurer, R. R. Deas, Jr., American Cast Iron Pipe Co. Directors elected were J. S. Bridges, United States Pipe & Foundry Co.; Arthur C. Smith, Hardie-Tynes Mfg. Co.; William Oberhelman, vice-president, Hill & Griffith Co.; John W. Porter, president, Alabama By-Products Corp.; C. L. Bransford, assistant general manager, Republic Steel Corp.; Karl Landgrebe, vice-president, Tennessee Coal, Iron & Railroad Co., and Charles A. Hamilton, president, Alabama Pipe Co., Anniston.

The nominating committee was headed by Russell Hunt, sales manager, Sloss-Sheffield Steel & Iron Co. R. E. Kennedy, technical secretary, American Foundrymen's Association, Chicago, attended and assisted in the formation of the Birmingham chapter, which has a charter list of over 70 members.

Four technical sessions were held, with H. J. Noble, American Cast Iron Pipe Co.; W. O. McMahon, Sloss-Sheffield Steel & Iron Co.; Walker Reynolds, Alabama Pipe Co.; R. E. Kennedy and T. G. Johnston serving as chairman.

George R. Ozley, mechanical engineer for the by-products plant of the Alabama By-Products Corp. presented a paper on "Problems in the Manufacture of Foundry Coke"; B. N. Hodges, sales engineer, the Carborundum Co., Niagara Falls, N. Y., "Grinding in the Foundry"; V. A. Crosby, metallurgist, Climax Molybdenum Co., Detroit, on "Alloy Cast Iron"; Harry W. Dietert, chief engineer, United States Radiator Co., Chicago, on "Sand Testing and its Application in the Foundry"; G. O. Stanley, general superintendent, Dortch Stove Works, Franklin, Tenn., on "The Practical Opera-

tion of a Stove Foundry Equipped with a Continuous Pouring System."

J. T. MacKenzie, metallurgist, American Cast Iron Pipe Co., and F. B. Riggan, metallurgist, Stockham Pipe Fittings Co., led a discussion of the American Foundrymen's Association "Cast Metals Hand Book."

At the luncheon on Thursday, Feb. 27, R. A. Polglaze presided and the guest speaker was James L. Wick, Jr., president, Falcon Bronze Co., Youngstown, and president-elect of the American Foundrymen's Association. Luncheon on Friday was held at the Thomas works of the Republic Steel Corp.

W. L. Batt, president of SKF Industries, Inc., and president of the American Society of Mechanical Engineers, was the principal speaker at the annual banquet on Friday night, with J. W. Eshelman presiding and Carson W. Adams serving as toastmaster. Mr. Batt's talk was largely devoted to the engineering profession, what it had accomplished and what progress had been made.

Sharon Steel Refunding Plan Meets Approval

STOCKHOLDERS of Sharon Steel Hoop Co., at a meeting held on Feb. 27, voted to approve the changes in their company's set-up recently proposed by the corporation's directors. The name of the company will be changed to Sharon Steel Corp. The charter by-laws will be amended so as to permit a greater flexibility of operations. The \$5,328,000 of 5½ per cent bonds due 1948 will be refunded by issuing \$2,000,000 of 4½ per cent convertible debentures and 40,000 shares of 5 per cent convertible preferred stock.

Although these alterations to the corporation's structure should facilitate the acquisition of Pittsburgh Steel Co. by the Sharon organization, which recently purchased a large bloc of the former company's stock, little reference to this matter was made at the stockholders' meeting.



KOPPERS OFFERS:

BECKER OVEN PLANTS . . . GAS PRODUCERS . . . WATER GAS PLANTS . . . LIQUID PURIFICATION PLANTS . . . PHENOL REMOVAL PLANTS . . . MATERIAL HANDLING PLANTS . . . BY-PRODUCT EQUIPMENT . . . BENZOL PLANTS . . .

NEW BECKER OVENS

- The New Becker Oven Battery of The Public Service Electric & Gas Company was placed in operation at Camden, New Jersey, in October 1935.
- Equipped with the latest type of self-sealing doors and having as a new feature, *exceptionally low differential pressure*, this installation commands the attention of the by-product coke oven industry.

THE KOPPERS CONSTRUCTION COMPANY
Pittsburgh Pennsylvania

Improvements Scheduled for Rouge Gas and By-Products Systems

NEW by-products recovery equipment for the coke ovens department of the Ford Rouge plant which will provide improved and more economical methods of recovery is being installed at a cost of \$500,000.

Coupled with this project are plans for handling greatly increased quantities of fuel gas for departments of the Rouge plant of the Ford Motor Company, embracing construction of a new 10,000,000-cu. ft. gas holder, installation of a propane gas-mixing station and improvement and enlargement of gas pipe lines, were announced today at the company's offices.

The by-product installations, which will be used to treat gas from two new batteries of coke ovens which are being constructed and from an older battery which is being retained, are included in a \$4,000,000 coke ovens construction

program which will materially increase output of fuel gas for plant consumption at the Rouge. The Ufer process will be utilized.

An electrically-operated supervisory control system will provide automatic and remote control of all gas consumption points in the Rouge plant by a single dispatcher. This is believed to be the first application of such a control unit to an industrial gas system.

At present there are 33,600,000 cu. ft. of gas from coke ovens available for plant use. This will be increased to nearly 42,000,000 with the completion of new coke ovens next year, despite the razing of two older batteries of ovens. This supply, together with the potential source of 30,000,000 cu. ft. from the propane station, will give the Rouge plant a maximum potential supply of 72,000,000 cu. ft. of fuel gas.

Announces New Line Of Electric Hoists

A NEW line of electric hoists designed primarily for "spot handling" has been introduced by the Harnischfeger Corp., Milwaukee. Known as "Zip-Lifts," these new hoists handle loads from 250 to 500 lb., are all welded and exceptionally light. With a ball-bearing motor especially designed for hoisting service and smooth operation through a simplified planetary gear train which is fully enclosed and running in oil, these

hoists have a 32-ft.-per-min. hoisting speed and are controlled either by push button or pendant rope. Safety features include weight-type limit switch, solenoid dry-disk brake and ratchet and roller type mechanical brake. Standard units are furnished with or without the trolley.

Steel Institute to Meet on May 28

THE 45th general meeting of American Iron and Steel Institute will be held at the Waldorf-Astoria, New York, Thursday, May 28. Program and further details of the meeting will be available later.

Voges Heads New Casting Company

HERMAN VOGES, JR., formerly president and executive head of the Webster & Perks Tool Co., Springfield, Ohio, is now president and general manager of Albra Castings Corp., Huntingdon, Ind., a company formed recently for the purpose of engaging in the exclusive production of aluminum, brass, bronze and other non-ferrous castings to the specifications and analysis of the consuming trade, the

principle objective being to major in long run orders for castings of stricter analysis and specification than is usual in the ordinary job foundry. Vincent W. Pacula, who was formerly associated with Campbell Wyant & Cannon Foundry Co. and Studebaker Corp., is vice-president, and Senour B. Richey and Charles L. Terrel, secretary and treasurer respectively.

Fairless Sees Larger Market for Stainless

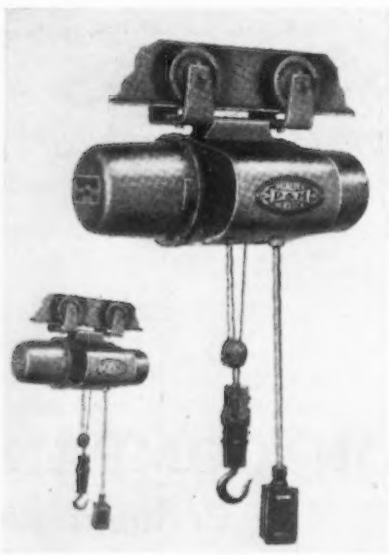
RESearch has developed that steel will be used to a much greater extent in future home building, in conjunction with other building materials, rather than the extensive building of all-steel houses, according to Benjamin F. Fairless, president, Carnegie-Illinois Steel Corp., in an address at the annual banquet of the Pittsburgh Builders' Exchange on Feb. 25 at the Hotel William Penn, Pittsburgh.

Mr. Fairless called attention to the increasing demand for stainless steel, which throughout the depression showed increasing demands as a result of the numerous uses for this type of steel. He alluded to the fact that individual and collective success of the country is contingent upon the prosperity of the greatest number of people and that the greatest number of people are dependent upon payrolls. Any misunderstanding, he pointed out, which has a tendency to affect payrolls in any way has an equal effect upon the nation's people.

Sheet & Tube Plans Refunding Operation

YOUNGSTOWN Sheet & Tube Co. is considering the refunding of its \$84,962,000 outstanding first mortgage 5 per cent bonds in order to take advantage of present low interest rates. A special meeting of the stockholders will be held March 31 to discuss the matter and take such action as may be found desirable.

An issue of debentures is proposed which may be converted into common shares under such terms and conditions as the directors may determine. Holders of common shares will be asked to waive and release their preemptive rights in respect to not to exceed 600,000 of the unissued common shares to be reserved for conversion of debentures.



COMING MEETINGS

Meetings in March

March 2 to 6. American Society for Testing Materials. Spring group meeting of committees. Regional meeting, March 4. William Penn Hotel, Pittsburgh. C. L. Warwick, 260 Broad Street, Philadelphia, secretary.

March 3 to 6. American Management Association. Packaging conference and exposition. Hotel Pennsylvania, New York. Alvin E. Dodd, 20 Vesey Street, executive vice-president.

March 9 to 12. National Railway Appliance Association. Annual convention and exhibit. Coliseum, Chicago. C. W. Kelley, 910 South Michigan Avenue, Chicago, secretary.

March 16. Joint meeting of Chicago section of American Society of Mechanical Engineers, the Western Society of Engineers, and Chicago chapter of American Foundrymen's Association. Engineering Auditorium, 205 West Wacker Drive, Chicago. Two-day exhibit of castings, March 16 and 17, in conjunction with meeting.

March 18 to 20. National Association of Waste Material Dealers, Inc. Annual convention. Hotel Astor, New York. Charles S. Haskins, 1109 Times Building, New York, secretary.

March 29 to April 4. American Ceramic Society. Annual convention. Columbus, Ohio. Ross C. Purdy, 2525 North High Street, Columbus, secretary.

Meetings in April

April 13 to 17. American Chemical Society. Semi-annual convention. Kansas City, Mo. Dr. Charles L. Parsons, 728 Mills Building, Washington, secretary.

April 16. National Council of Shipbuilders. Annual convention. Whitehall Club, New York. C. C. Knerr, 11 Broadway, New York, secretary.

April 16 to 17. American Institute of Mining and Metallurgical Engineers. Open-hearth committee meeting. Statler Hotel, Detroit. L. F. Reinartz, works manager, American Rolling Mill Co., Middletown, Ohio, secretary.

April 20 to 24. Midwest Power Engineering Conference and Midwest Engineering and Power Exposition. Palmer House, Chicago. Exposition at International Amphitheatre, Chicago. G. E. Pfisterer, 308 West Washington Street, Chicago, secretary.

April 22 to 23. Association of Iron and Steel Electrical Engineers. Spring engineering conference. Youngstown. Brent Wiley, 1010 Empire Bldg., Pittsburgh, managing director.

April 27 to 30. Chamber of Commerce of the United States. Annual meeting. Washington. D. A. Skinner, 1615 H Street, Washington, secretary.



Logan heavy duty roller conveyor handling coils weighing up to 10,000 pounds from storage to continuous pickling.

WHAT'S NEW in handling?

In Pittsburgh, Gary or small milltown—an increasingly important question. And rightly so. For every Steel Mill Engineer and Production Executive is interested in current developments in steel mill Conveyors—because of the intimate relationship between better handling methods and efficient plant operation. The nearest Logan representative will be glad to discuss "What's New" in Conveyors with you. Just write LOGAN CO., Incorporated, 545 Buchanan Street, Louisville, Kentucky.

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Logan Conveyors

LOUISVILLE

Lorain Steel Sales Offices Consolidated

THE Carnegie-Illinois Steel Corp'n. has consolidated the Lorain division district offices with the present district offices at Chicago, Philadelphia, New York, Cleveland and Pittsburgh. The Lorain division personnel, which has been handling that part of the corporation's sales in the field, will

continue to be part of the sales organization and have been appointed in the following capacities at the cities noted: H. H. McDonald, special sales representative, railroad sales division, Western area, Chicago; S. G. Cotsworth, assistant manager of sales, Philadelphia. T. W. Brush, Otto Fischer and H. L. Gleeson have been appointed special sales representatives at New York, Cleveland and Pittsburgh, respectively.

February Pig Iron Output Declines 3.5 Per Cent

PRODUCTION of coke pig iron during February amounted to 1,827,972 gross tons, compared with 2,025,885 in the preceding month. The daily rate last month declined 3.5 per cent, or from 65,351 tons to 63,034 tons.

There was a gain of four stacks making iron on March 1, the 121 furnaces operating at a rate of 64,695 tons daily, compared with 117 one month before which were producing iron at a rate of 63,660 tons daily. Six stacks were blown in during the month and two were blown out or banked. The Steel Corporation blew in four furnaces, and independent steel companies put two in operation and blew out or banked two units.

The furnaces blown in were one Clairton, one Central and one Gary stack of the Carnegie-Illinois Steel Corpn.; one Lorain furnace, of the National Tube Co.; one Haselton furnace, of the Republic Steel Corpn., and a Colorado unit of the Colorado Fuel & Iron Co.

Blown out or banked were The Swedeland furnace, Alan Wood Steel Co., and one Sparrows Point furnace of the Bethlehem Steel Co.

Daily Average Production of Coke Pig Iron

	Gross Tons				
	1936	1935	1934	1933	1932
January	65,351	47,656	39,201	18,348	31,380
February	63,034	57,448	45,131	19,798	33,251
March		57,098	52,243	17,484	31,201
April		55,449	57,561	20,787	28,430
May		55,713	65,900	28,621	25,276
June		51,750	64,338	42,166	20,935
½ year.....		54,138	54,134	24,536	28,412
July		49,041	39,510	57,821	18,461
August		56,816	34,012	59,142	17,115
September		59,216	29,935	50,742	19,753
October		63,820	30,679	43,754	20,800
November		68,864	31,898	36,174	21,042
December		67,950	33,149	38,131	17,615
Year		57,556	43,592	26,199	23,733

Production of Coke Pig Iron and Ferromanganese†

	Gross Tons Pig Iron*		Ferromanganese†	
	1936	1935	1936	1935
January	2,025,885	1,477,336	24,766	10,048
February	1,827,972	1,608,552	24,988	12,288
March		1,770,028		17,762
April		1,663,475		18,302
May		1,727,095		17,541
June		1,552,514		12,961
½ year.....		9,799,000		88,902
July		1,520,263		13,175
August		1,761,286		12,735
September		1,776,476		15,983
October		1,978,411		19,007
November		2,065,913		18,245
December		2,106,453		17,126
Year		21,007,802		185,173

*These totals do not include charcoal pig iron. The 1934 production of this iron was 25,834 gross tons.
†Included in pig iron figures.

Merchant Iron Made, Daily Rate

	Tons				
	1936	1935	1934	1933	1932
January	10,537	3,926	7,800	2,602	6,256
February	11,296	6,288	7,071	2,863	7,251
March		7,089	7,197	2,412	7,157
April		8,799	8,838	1,908	5,287
May		8,441	9,099	3,129	4,658
June		7,874	9,499	4,088	6,090
July		8,644	7,880	6,783	3,329
August		8,194	6,043	7,756	3,070
September		10,090	4,986	10,034	3,212
October		11,199	5,765	8,634	4,286
November		12,503	6,610	7,639	4,435
December		13,312	4,399	8,358	3,674

Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons)		March 1		February 1	
	February (29 Days)	January (31 Days)	Number in Blast	Operating Rate, Tons a Day	Number in Blast	Operating Rate, Tons a Day
New York:						
Buffalo	104,785	129,952	7	3,615	7	4,190
Other New York and Mass.	6,156	5,670	1	210	1	185
Pennsylvania:						
Lehigh Valley.....	33,724	37,655	3	1,165	3	1,215
Schuylkill Valley....	13,843	20,044	1	335	2	645
Susquehanna and Lebanon Valleys	11,629	11,979	1	400	1	385
Ferromanganese			0		0	
Pittsburgh District.....	354,130	381,370	20	12,450	19	11,005
Ferro. and Spiegel.....	11,141	10,203	3	385	3	450
Shenango Valley.....	18,511	20,815	1	640	1	630
Western Pennsylvania....	51,143	64,176	4	1,765	4	2,070
Ferro. and Spiegel.....	5,860	6,382	1	200	1	205
Maryland	69,246	86,799	3	2,390	4	2,800
Wheeling Distict.....	98,746	135,033	7	3,405	7	4,355
Ohio:						
Mahoning Valley.....	193,406	211,482	11	7,155	10	6,820
Central and Northern....	166,879	183,873	12	6,040	10	5,930
Southern	41,658	30,262	4	1,435	4	975
Illinois and Indiana.....	378,423	412,090	20	13,670	19	12,870
Mich. and Minn.....	77,327	83,270	5	2,665	5	2,685
Colo., Mo. and Utah.....	24,505	19,547	3	1,015	2	630
The South:						
Virginia			0		0	
Ferro. and Spiegel.....	2,770	3,019	1	95	1	95
Kentucky	12,892	13,378	1	445	1	430
Alabama	145,981	153,724	11	5,035	11	4,925
Ferromanganese	5,217	5,162	1	180	1	165
Tennessee			0		0	
Total	1,827,972	2,025,885	121	64,695	117	63,660

The Traffic Club of Pittsburgh will hold its thirty-fifth annual dinner at the Hotel William Penn, Pittsburgh, March 5. The speakers' committee for the meeting consists of W. F. Morris, Jr., vice-president, Weirton Steel Co.; H. E. Graham, assistant to the president and general traffic manager, Jones & Laughlin Steel Corpn., and H. C. Oliver of the Pennsylvania Railroad. Col. George T. Buckingham of Chicago will be the principal speaker.

New and revised requirements for rotating electrical machinery are now available in a single volume, entitled "American Standards for Rotating Electrical Machinery," published by the American Standards Association, 29 West Thirty-ninth Street, New York. The specifications cover machinery ranging from large central station generators and industrial and steel-mill motors to the small motors used on household appliances.

OBITUARY

JAMES E. FERRIS, formerly vice-president, secretary and treasurer of Corrigan, McKinney Steel Co., Cleveland, died suddenly Feb. 27 of a heart attack, aged 65 years. Mr. Ferris after his graduation from the University of Michigan in 1892 became connected with the company as an accountant and later became one of the officers. He retained his connection with the company until 1928, when he retired.

♦ ♦ ♦

JOHN G. MATTHEWS, president, Berea Machine & Tool Works, Berea, Ohio, died Feb. 25, aged 74 years.

♦ ♦ ♦

JOHN E. GARRITY, Pacific Coast representative at Los Angeles for Superior Steel Corp., Pittsburgh, died recently at his home in that city. He had spent the greater part of his business life with the West Leechburg Steel Co., Pittsburgh, having become associated with it about 1910. He was general sales manager for that company until 1930, when he retired because of ill health and established his residence on the Pacific Coast.

♦ ♦ ♦

HERMAN FORG, for nearly 50 years president and treasurer of the Forg Mfg. Co., hardware manufacturer specializing in sheet metal stampings, died on Feb. 24 in Somerville, Mass.

♦ ♦ ♦

FRANK H. TUTHILL, president of the Tuthill Spring Co., Chicago, died Feb. 24 at his home in Evanston, Ill. He went to Chicago in 1880 and with his brother organized the Spring company.

♦ ♦ ♦

DAWSON H. SKEEN, head of D. H. Skeen Co., Chicago, sales engineer, died Feb. 24 at Flossmoor, Ill. Mr. Skeen was born at Bell Buckle, Tenn., and was graduated from United States Naval Academy in 1910. He saw service during the World War and at its close he became assistant to the president of the Edward Valve & Mfg. Co. Later he established his own engineering sales concern.



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Cold Drawn Bars and Shafting • Special Sections • Alloy Steels

BLISS & LAUGHLIN, INC.

HARVEY, ILL. Sales Offices in all Principal Cities BUFFALO, N.Y.

Bearing Orders by Railroads Large

INCREASED buying on the part of railroads is reflected in the sales of the Timken Roller Bearing Co., Canton, Ohio. Burlington has ordered bearings and boxes to equip all driving axles of three new locomotives being built in its own shops and has also equipped seven other locomotives with Timken bearings. Illinois Central's new high speed five-car streamlined

Diesel train is being furnished with Timken bearings. Timken will equip two locomotives being constructed at the Roanoke shops of Norfolk & Western with bearings and boxes. Grand Trunk Western has ordered bearings for engine trucks of two locomotives from the company and Timken bearings will be used on a 600-hp. Diesel engine being built by the Baldwin Locomotive Works, Philadelphia.

Lathe Grinder.—The Dumore Co., Racine, Wis. Circular. Introduces the Dumore No. 44, small lathe grinder. Illustrates internal and external usages.

P E R S O N A L S

J. V. HONEYCUTT, since 1934 assistant general manager of sales of the Bethlehem Steel Co., has been appointed assistant vice-president in charge of sales. JOHN M. ELLIS, formerly manager of sales for the New York district, becomes general manager of sales, and C. M. DENISE continues as general manager of sales for fabricated steel construction. H. G. WALTON, heretofore general manager of sales, has been made assistant to vice-president. C. W. BRETLAND has been promoted from assistant manager of sales in New York, to manager of sales for that district. ANDREW CONNEEN continues as manager of sales for fabricated steel construction in the New York district. H. H. FULLER, of the New York sales staff, becomes assistant manager of sales for the New York district. Messrs. Honeycutt, Ellis and Walton will have offices at Bethlehem, Pa., and Messrs. Bretland and Fuller will continue to have their offices at 25 Broadway, New York.

W. B. KENNEDY, formerly manager of sales in the Philadelphia district, has been made special representative in that district. L. M. PARSONS, who has been assistant manager of sales in Philadelphia, has become manager of sales. P. B. BURTIS, heretofore on the sales staff of the Philadelphia office, succeeds Mr. Parsons.

♦ ♦ ♦

E. E. GRIEST, heretofore vice-president in charge of manufacture

of the Chicago Railway Equipment Co., Chicago, has been appointed vice-president and general manager of the Fort Pitt Malleable Iron Co., Pittsburgh. Following his graduation from Purdue University in 1907, he served consecutively in the shops of the Erie and Pennsylvania railroads until 1918, when he was made assistant general superintendent of the Chicago Railway Equipment Co. The following year he became general superintendent and acted in this capacity until June, 1931, when he was made vice-president in charge of manufacture. During NRA days, he was a member of the code authority of the malleable industry and of the concrete reinforcing industry.

♦ ♦ ♦

CARL W. BETTCHER, for the past 17 years identified with the Eastern Machine Screw Corp., New Haven, Conn., has been elected vice-president.

♦ ♦ ♦

J. D. WRIGHT and KARL H. RUNKLE have been appointed assistant managers of the industrial department of the General Electric Co. Prior to their promotions, Mr. Wright was assistant head of the department's engineering staff and Mr. Runkle was manager of sales of the department's mining and steel mill section. Mr. Wright joined the company in 1909, after his graduation from the University of Wisconsin and Mr. Runkle became identified with the company

in 1917, after graduation from Iowa State College.

♦ ♦ ♦

A. M. STEEVER has been appointed superintendent of the Columbia Tool Steel Co.'s manufacturing plant at Chicago Heights, Ill. Mr. Steever began his business career in the shops of the Buick Motor Co., Flint, Mich., from which position he joined the first metallurgical division established by the Chevrolet Motor Co. He later was with the United States aircraft metallurgical inspection and control service. Following this, he was again employed by Buick and later by the Wyman-Gordon Co., Harvey, Ill. He later served seven years with the Great Lakes Forge Co., Chicago, and during the last two years he has been associated with the Lindberg Steel Treating Co. and the Lindberg Engineering Co.

♦ ♦ ♦

R. R. COOLEY, who has been engaged for many years in the study and application of refractories, has been appointed production manager of the Cooley Electric Furnace Co., Indianapolis. He is a brother of W. B. COOLEY, president of the company.

♦ ♦ ♦

M. ROGERS, heretofore factory manager of the tractor division of the Caterpillar Tractor Co., Peoria, Ill., has been named general factory manager. He is being succeeded as factory manager of the tractor division by JAMES R. MUNRO, who has been superintendent of the new Diesel engine assembly line and assistant superintendent of tractor erection. Mr. Rogers became identified with the



J. V. HONEYCUTT



J. M. ELLIS



C. W. BRETLAND



H. H. FULLER

company in 1922 as foreman of the turret lathe department of the C. L. Best Tractor Co., one of the predecessors of the present company. In 1927 he was named assistant factory manager of the Peoria plant and two years later factory manager. Mr. Munro was assigned to the toolroom of the company in 1918 and made foreman of this department in 1925. He was later placed in charge of the company's heat-treating plant in San Leandro, Cal., and later transferred to the Peoria plant to the position he held before his present promotion.



WARDEN F. WILSON, who has been identified with the American Steel Foundries since his graduation from the University of Illinois, has been appointed manager of the Pittsburgh plant of the company, succeeding W. J. MILLER, who has resigned. Mr. Wilson has been assistant manager of the East Chicago, Ind., plant since April, 1929. L. R. MEYER has been made super-

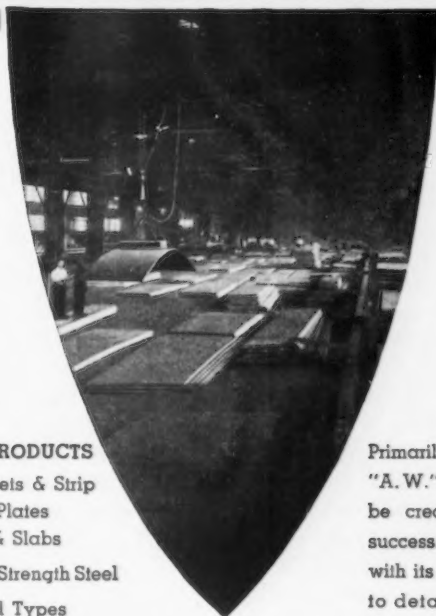


W. F. WILSON



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Primarily it is the integrity of "A.W." Products which is to be credited with Alan Wood success. But "A.W." Service, with its more personal attention to detail, has contributed to that success in no small degree.

"A.W." Service includes immediate deliveries from ample standard stocks maintained by distributors and warehouses in principal cities, as well as prompt execution of special mill orders.

And the competent services of our Metallurgical and Engineering Departments are freely offered in applying "A.W." products to the more efficient and economical solution of your problems.

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BRANCHES:

Philadelphia, New York, Boston, Los Angeles, San Francisco, Seattle, Houston

110 YEARS' IRON- AND STEEL-MAKING EXPERIENCE



intendent. W. O. PARHAM, assistant manager of the Pittsburgh plant has resigned.



ALFRED MUSSO, since 1916 consulting metallurgist with offices in New York, has been elected president of the Burden Iron Co., Troy, N. Y., succeeding George McM. Godley. Mr. Musso came to this country from Italy in 1902, after receiving degrees from the universities of Naples and Liege.

ROBERT KEMP has been made vice-president and comptroller of the company in charge of development and financial policies with special attention to the metallurgical requirements of the transport industries for high-weight-strength ratio alloy steels. ARTHUR E. SWAN, formerly chief engineer of the Atha works of the Crucible Steel Co. of America and later vice-president and general manager of the Sharon Pressed Steel Co., Sharon, Pa., is

(CONTINUED ON PAGE 75)

Beryllium and Beryllium Alloys

(CONCLUDED FROM PAGE 32)

supplied from that plant. The Beryllium Products Corp. has United States patent rights for production of many of the alloys of beryllium.

Special melting technique has been developed for the casting of commercial beryllium copper. Originally it was thought best practice to superheat the pure copper before adding the master alloy. Later findings of Ampco Metal, Inc., however, indicated that alloying is best done at low temperatures. Current practice is as follows: The correct charge of copper is calculated, heated to about 1850 deg. F., and deoxidized. The correct amount of master alloy is then introduced, held under the surface of the copper and gently stirred with a carbon rod. All undue agitation is avoided and the surface of the metal is covered with charcoal. Surface-dried molds are used, and the beryllium copper is poured at as low a temperature as possible.

After the castings are shaken out and roughly cleaned, the first quench or solid-solution treatment is accorded. This first treatment consists of soaking the castings at approximately 1475 deg. F. for two to three hours. At this temperature all of the beryllium is taken into solution by the copper. Immediately upon removal from the furnace, the work is quenched in water. The alloy is thus in its softest and most ductile state, having a Brinell hardness of approximately 100 points and suitable for easiest machine work and finishing.

After all necessary work has been done on the tools, the second, or precipitating, treatment is given. This treatment consists of holding the work at approximately 575 deg. F. for a period of from 1 to 5 hr., depending on the properties desired. During this period the beryllium is precipitated out of solution in submicroscopic globules, affording maximum strengths and hardnesses. Normally a 2½-hr. treatment is sufficient to give a Brinell hardness of approximately 325 points. For chisels and similar tools having cutting edges, a hardness of 375 to 400 points is desirable, while for open-end wrenches and similarly stressed tools a hardness of 225 to 275 Brinell is desirable. Specific treatment will

therefore depend on the service to which the work is to be put.

For small or light-sectioned pieces, a water quench from the precipitating treatment is usually recommended. For larger pieces an oil quench is less likely to cause quench cracks and strains set up from volume changes. Experience at Ampco Metal, Inc., has shown, however, that an oil quench for all castings gives a tougher structure without sacrificing appreciable hardness.

The most important phase of the production of beryllium copper castings lies in the two heat treatments given. Temperature limits must be strictly adhered to; for in the case of the solid solution, or first treatment, disintegration due to formation of a liquid phase begins to take place at about 1525 deg. F. And in the case of the second treatment it is found that precipitation does not take place above 625 deg. F.

Heavy-Duty Bridge Deck Is of Cellular Construction

(CONCLUDED FROM PAGE 43)

2. The flat plate of a given deck unit, after being placed in final position, and the flange of the stringer may be drilled with a high-speed drill and fastened with hardened drive screws driven with a hammer. This method is particularly suitable in the case of the installation of a new deck on existing stringers.

3. Both the deck units and the flanges of the stringers may be prefabricated, so that bolting or riveting may be done subsequently in the conventional manner; likewise bolt and rivet holes may be drilled in the field.

The longitudinal edges between each four-cell deck unit are fabricated for butt welding in the field. Tests have disclosed, it is stated, that a continuous weld in the middle third of the span and 50 per cent welding in the end thirds of the span develop full resistance to maximum horizontal shear and are adequate for the needs for transverse load distribution.

The deck units constitute the load-carrying element of the bridge floor and are structurally independent of the wearing surface. After the deck units are in place,

intercell trough filling of concrete or any desired composition material is added. This provides a satisfactory temporary wearing surface. The actual wearing surface is placed last. This may consist of reinforced concrete, brick, asphalt planks, sheet asphalt, or other suitable material.

An interesting incidental use of the cellular type of construction is that it may be aligned, end to end of the bridge, so that the cells may carry wires or cables, thus obviating the necessity for conduits.

The deck units are protected against corrosion by two methods. The standard method consists of hot-dipping the units endwise in a tank containing an especially developed asphaltic enamel coating. After the coating is applied it is baked on. This type of coating imposes no limitation on electric field welding. Another method used to provide protection against more severe conditions is to immerse the unit endwise in a bath of hot asphalt. With this coating the use of drive rivets, bolts and other similar methods of attachment are preferable to electric welding.

\$5,000 Home Price Too High

(CONCLUDED FROM PAGE 38)

of a variety of building materials. The only drawback to the plan is that the houses will cost about \$5,000 each. These model homes are designed for a family of four. No compromise has been made in items which affect the soundness of the structures or that would impair their value as mortgage security over a term of years. The experience of those in charge has been that to maintain sound construction standards and provide reasonable space accommodations, many of the items usually associated with American living standards must be omitted.

Many cities are planning subdivisions which consist mostly of small homes. The prices of many of these homes exceed the maximum of \$2,500 that the average man will be able to pay, but it is significant that each year the prices are lower and the quality, design and livability of the homes greater.

Steel makers have their eyes on this large market of small inexpensive homes. Steel houses are rapidly being designed which are not only cheaper than ever before and cheaper than frame houses, but which are also comfortable, handsome and extremely durable.

PERSONALS

(CONTINUED FROM PAGE 73)

to be works manager. O. A. VAN DENBURGH retires from the vice-presidency to become secretary of the company and will be in charge of all wrought iron activities. FRANK HODSON, formerly president of the former Empire Steel Castings, Inc., Reading, Pa., is to be technical assistant to the president and consulting engineer for the company.

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ERNEST C. KRON, a graduate of the University of Minnesota, in 1930, has joined the staff of Battelle Memorial Institute, Columbus. Mr. Kron, who has been a steel mill metallurgist since graduation, has been assigned to the division of process metallurgy at Battelle.

❖ ❖ ❖

GEORGE T. LADD, president, United Engineering & Foundry Co., addressed the members of the American Institute of Banking at the Hotel William Penn, Pittsburgh, on Feb. 27, on the changes taking place in the steel industry.

❖ ❖ ❖

B. F. FAIRLESS, president Carnegie-Illinois Steel Corp., was principal speaker at the twenty-sixth annual banquet of the Pittsburgh Builders Exchange at the Hotel William Penn, Pittsburgh, on Feb. 25.

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BEN KAPLAN, of M. S. Kaplan Co., Chicago scrap firm, has been made a member of the executive committee of the Institute of Scrap Iron and Steel and will serve as chairman of the chapter welfare committee. W. J. ROSS, of Hyman-Michaels Co., Chicago, will act as chairman of the executive committee.

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CHARLES R. SURFACE, of Chicago, has been appointed sales manager of the electric motor sales division of the Harnischfeger Corp., with headquarters at the main office in Milwaukee. He was formerly with the Sprague Electric Works of General Electric Co., and later was connected with the Westinghouse Electric & Mfg. Co., in charge of the building equipment department of the industrial division of the Chicago district office.

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EDWARD B. FRIEDLANDER, of the Loewenthal Co., Chicago, has been nominated president of the National Association of Waste Mate-

Made for Your Product exactly as your needs specify

From proper specification, through exacting production and dependable delivery, Thomas service most adequately meets every requirement of modern industry for cold rolled strip steels. A product of specialized production, Thomastrip is made and delivered with constant dependability exactly as needed. Correct analysis, uniform temper, precision gauge and fine finish assure Thomastrip users less waste, fewer rejections and lower costs. Investigate Thomastrip for your product. Without obligation a Thomas representative will gladly cooperate with you.

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THE THOMAS STEEL COMPANY
WARREN, OHIO

Specialized Producers of Cold Rolled Strip Steel



Thoma Strip

COLD ROLLED
STRIP STEEL

BRIGHT STEEL-ZINC COATED
COPPER COATED-CADMIUM COATED

rial Dealers, Inc., New York, for a second term.

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WALTER PRICE has resigned as president, treasurer and general manager of the Philadelphia Range Boiler & Tank Co., Philadelphia, and is disposing of his entire financial interest in the company. As soon as the necessary papers can be prepared the Walter Price Co. will be incorporated to manufacture galvanized range

boilers and kindred products. Temporary address of the company is 2045 North Broad Street, Philadelphia.

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MERLE J. TREES, Chicago Bridge & Iron Works, has been reelected president of the Steel Plate Fabricators Association. Also reelected are W. H. JACKSON, Pittsburgh Des Moines Steel Co., vice-president; and A. O. MILLER, Petroleum Iron Works Co., Sharon, Pa., treasurer.



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INDUSTRIAL, ARCHITECTURAL, DECORATIVE
 Industrial Screens for all purposes.
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 forated metal products of the better quality.
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Sales Representatives in all principal cities.

Republic to Spend \$3,000,000 on Plant Improvements—1935 Sales Up Sharply

REPUBLIC STEEL CORPN., Cleveland, is planning the expenditure of approximately \$3,000,000 for plant extensions and improvements. The largest project will be the rebuilding and enlarging of one of the blast furnaces and improving dock and ore unloading facilities at the company's Corrigan, McKinney plant in Cleveland at a cost of \$1,300,000. The capacity of the blast furnace that will be rebuilt will be increased to about 1000 tons a day or nearly double its present capacity.

The new construction program will include a wire mill at the company's South Chicago Works involving an expenditure of \$1,000,000; improvements in the tube mill, coke plant open-hearth furnaces and transportation facilities at Youngstown costing \$200,000 and improvements to the tin mills and open-hearth furnaces at Warren, Ohio, also involving an expenditure of \$200,000.

Dock improvements at the Corrigan, McKinney Works in Cleveland will include putting in piling, the provision of automatic scales and electric car spotters to facilitate the handling of ore and new facilities for handling limestone and scrap. With improved ore

handling facilities the company plans to handle at the Cleveland docks practically all the ore and other materials shipped by water, not only for the Cleveland plant but also for the plants in Youngstown, Warren, Canton and Massillon. Considerable of the ore for the Mahoning Valley plants has heretofore been shipped through Conneaut.

Early this year the company authorized the expenditure of \$1,200,000 for capital improvements, chiefly in its Warren and Youngstown plants. With the new authorization of expenditures the company's announced program of improvements for this year will amount to approximately \$4,200,000.

Net Profit Was \$4,455,735 in 1935

The Republic Corporation had net profit in 1935 of \$4,455,735, compared with a net loss in 1934 of \$3,459,428. All charges, including depreciation and depletion, were deducted.

Net sales of the corporation and its subsidiaries totalled \$137,117,708, as against \$97,432,562 in 1934.

The figures include operations of Corrigan, McKinney Steel Co.

from Oct. 1, 1935, to end of the year, but do not include Truscon Steel Co., which, through Dec. 31, 1935, was carried on Republic's books as an investment.

As a result of the acquisition of Corrigan, McKinney and control of Truscon, financed during 1935, Republic increased its funded debt from \$44,943,200 as of Dec. 31, 1934, to \$78,218,248 as of Dec. 31, 1935.

Dividends on the corporation's 6 per cent cumulative convertible preferred stock have been paid to Oct. 1, 1930, and dividends on the 6 per cent cumulative convertible prior preference series A stock accrue from Jan. 1, 1935. Against the latter accrual a dividend of \$1.50 a share has been declared, payable Jan. 1, 1936.

T. M. Girdler, chairman of Republic, said in the annual statement that "the outlook is favorable for continued improvement in the company's business over the coming months." Because of current gains from sources of demand other than the automotive industry, he said he thought output for the first half of the year should exceed that for the first half of 1935, if normal factors are not checked by political uncertainties. Structural activity, demand for pipe and miscellaneous articles, tin plate requirements, a looked for expansion in automotive needs, and an increasing use of alloy and stainless steels were cited by Mr. Girdler as among causes responsible for the strong position his company is now in.

Alma Mfg. Co. Reorganizes

THE Alma Motor Co. has recently been formed as a Michigan corporation to buy and operate the business of the Alma Mfg. Co., Alma, Mich. The company is engaged in the manufacture and sale of four-wheel drive units for conversion of Ford and Chevrolet 1½-ton trucks. These units are marketed through Ford and Chevrolet dealers.

William W. Schenck, formerly secretary-treasurer of the Alma Mfg. Co., becomes president of the motor company. F. L. Armstrong, formerly vice-president of the Thorne Motor Corp., Chicago, becomes vice-president, and Willis S. Wyatt, formerly with Haskins & Sells, accountants, will be secretary-treasurer. The new firm has a capitalization of 300,000 shares of \$1 par stock.

Capital Goods Index Maintains Previous Level

INDUSTRIAL activity, as measured by THE IRON AGE capital goods index, is unchanged from two weeks ago. Last week the net effect of the opposing movements in the industrial series comprising the index resulted in the losses counterbalancing the gains. The national steel ingot rate, automobile production and Pittsburgh industrial activity scored individual advances, but lumber shipments and heavy construction work tapered off. In the aggregate, the fact that no additional recession occurred in the index is favorable, since the downward trend which has been in process for more than a month has at least been halted.

The index's present level of 70.9 per cent of "normal," as measured

The Iron Age Weekly Index Numbers of Capital Goods Activity

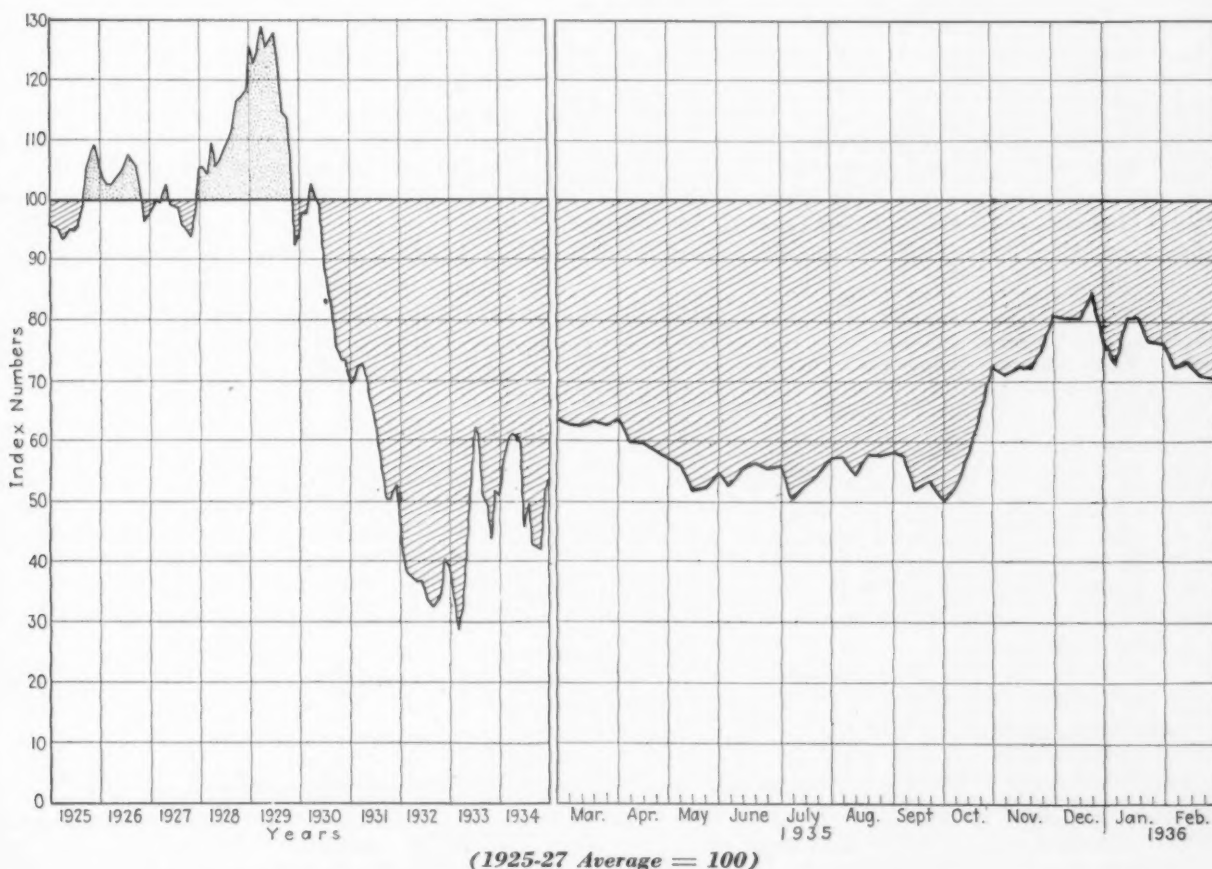
(1925-'27 = 100)

Last week	70.9
Preceding week	70.9
Same week last month	78.9
Same week 1935	60.2
Same week 1934	58.8
Same week 1933	32.3
Same week 1932	39.4
Same week 1931	70.4
Same week 1930	97.2
Same week 1929	123.1

by average business conditions during the period from 1925 to 1927, represents a loss of nearly eight

points from the figure established a month ago. Compared with the comparable week last year, the most recent reading is 18 per cent higher. It is 20 per cent higher than its comparable level two years ago.

Although only two months have elapsed since the year opened, THE IRON AGE cumulative index reveals that the industrial operating rate so far in 1936 has resulted in a materially higher cumulative production than obtained during the same period last year. The comparisons are 6.8 weeks of production for 1936 as against 5.5 weeks for 1935. The ratios, of course, are based on average weekly production during the period from 1925 to 1927.



THE Iron Age Index of Capital Goods Activity. The years 1925 to 1934 are plotted by months, by weeks since 1935.

Components of the index: Steel ingot production rate, from THE IRON AGE; revenue freight carloadings of forest products, from Association of American Railroads; automobile production from Cram's Automotive Reports; heavy construction contract awards, from Engineering News Record; index of productive activity in Pittsburgh district, from Bureau of Business Research of University of Pittsburgh.

Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	January, 1936	December, 1935	January, 1935	Year 1934	Year 1935
Raw Materials:					
Lake ore consumption (gross tons) ^a	2,951,568	3,100,530	2,280,393	22,113,951	30,861,473
Coke production (net tons) ^b	3,450,342	3,488,818	2,889,552	31,821,576	35,209,240
Pig Iron:					
Pig iron output—monthly (gross tons) ^c	2,025,885	2,106,453	1,477,336	15,911,188	21,007,802
Pig iron output—daily (gross tons) ^c	65,351	67,950	47,656	43,592	57,556
Castings:					
Malleable castings—production (net tons) ^d		45,598	43,400	369,458	466,395
Malleable castings—orders (net tons) ^d		42,573	44,568	354,146	452,611
Steel castings—production (net tons) ^d		37,793	29,035	450,087	398,988
Steel castings—orders (net tons) ^d		40,529	32,349	434,131	400,157
Steel Ingots:					
Steel ingot production—monthly (gross tons) ^e ..	3,049,439	3,081,807	2,871,531	25,599,118	33,425,576
Steel ingot production—daily (gross tons) ^e	112,942	123,272	106,353	82,312	107,478
Steel ingot production—per cent of capacity ^e ..	51.18	55.68	48.04	37.38	48.55
Employment in Steel Industry:					
Total employees ^f			407,071	409,349	
Total payrolls (thousands of dollars) ^g			\$44,329	\$457,848	
Average hours worked per week ^h			33.6	30.4	
Finished Steel:					
Trackwork shipments (net tons) ⁱ	3,366	3,025	2,333	49,110	42,229
Steel rail orders (gross tons) ^e	214,541	88,100	51,000		533,120
Sheet steel sales (net tons) ^j	174,805	203,318	321,831	1,830,682	2,473,489
Sheet steel production (net tons) ^j	223,000	208,774	235,714	1,895,460	2,424,990
Fabricated shape orders (net tons) ^k	117,218	96,235	64,306	1,054,382	1,068,603
Fabricated shape shipments (net tons) ^k	73,710	76,214	89,627	1,116,222	1,095,216
Fabricated plate orders (net tons) ^k	38,709	35,584	18,778	241,992	258,315
Reinforcing bar awards (net tons) ^k	67,810	29,025	17,750	182,351	318,340
U. S. Steel Corp'n. shipments (tons) ^l	721,414	661,515	534,055	5,925,873	7,371,299
Ohio River steel shipments (net tons) ^l	65,760	61,666	52,656	633,197	925,174
Fabricated Products:					
Automobile production, U. S. and Canada ^m	380,554	421,579	303,392	2,869,963	4,182,591
Construction contracts, 37 Eastern States ⁿ	\$204,792,800	\$264,136,500	\$99,773,900	\$1,543,108,400	\$1,844,544,900
Steel barrel shipments (number) ^d		541,375	438,334	6,682,400	6,872,452
Steel furniture shipments (dollars) ^d		\$1,558,095	\$1,139,497	\$11,807,843	\$15,523,679
Steel boiler orders (sq. ft.) ^d	623,426	684,735	391,784	4,368,563	6,245,158
Locomotive orders (number) ^m	14	2	0	183	30
Freight car orders (number) ^m	1,050	10,030	24	24,611	18,158
Machine tool index ^o	110.8	98.3	65.5	†46.2	†86.0
Foundry equipment index ^o	127.0	118.1	86.6	†60.5	†103.3
Foreign Trade:					
Total iron and steel imports (gross tons) ^p		93,678	22,784	316,761	469,954
Imports of pig iron (gross tons) ^p		16,289	2,033	115,470	130,937
Imports of all rolled steel (gross tons) ^p		21,812	15,054	113,354	216,567
Total iron and steel exports (gross tons) ^p		239,269	262,740	2,832,764	3,067,336
Exports of all rolled steel (gross tons) ^p		85,590	73,396	951,380	897,749
Exports of finished steel (gross tons) ^p		78,625	66,523	833,559	767,456
Exports of scrap (gross tons) ^p		142,135	179,630	1,835,554	2,047,290
British Production:					
British pig iron production (gross tons) ^r	595,500	559,300	521,200	5,978,500	6,426,000
British steel ingot production (gross tons) ^r	912,500	811,500	757,800	8,859,700	9,842,400
Non-Ferrous Metals:					
Lead production (net tons) ^s	36,296	42,020	29,314	412,298	421,764
Lead shipments (net tons) ^s	34,590	42,333	33,695	378,807	433,456
Zinc production (net tons) ^t	41,826	40,136	35,135	366,933	431,085
Zinc shipments (net tons) ^t	46,468	41,466	35,455	352,663	465,124
Deliveries of tin (gross tons) ^v	6,635	5,360	4,600	46,215	59,110

†Yearly average.

Source of figures: ^a Lake Superior Iron Ore Association; ^b Bureau of Mines; ^c THE IRON AGE; ^d Bureau of the Census; ^e American Iron and Steel Institute; ^f National Association of Flat-Rolled Steel Manufacturers; ^g American Institute of Steel Construction; ^h United States Steel Corp'n.; ⁱ United States Engineer, Pittsburgh; ^j When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; ^k F. W. Dodge Corp'n.; ^l Railway Age; ^m National Machine Tool Builders Association; ⁿ Foundry Equipment Manufacturers Association; ^o Department of Commerce; ^p British Iron and Steel Federation; ^q American Bureau of Metal Statistics; ^r American Zinc Institute, Inc.; ^s New York Commodities Exchange.

SUMMARY OF THIS WEEK'S BUSINESS

Quantity Differentials Considered as Means of Stabilizing Weak Steel Prices

Mills Defer Opening of Second Quarter Books Pending Announcement of Important Changes—Ingot Rate Up One Point to 56 Per Cent of Capacity

RECENT weakness of finished steel prices, notably quotations on sheets and strip, has prompted certain large producers to consider plans for the wide application of quantity differentials which would change radically the entire system of selling steel. Definite details of a plan will probably be announced by a leading company when sellers' books are formally opened for second quarter business, and it is understood that large buyers will be given deductions from base prices commensurate with the economical advantages to mills of the orders which they are able to place.

Quantity discounts have been successfully applied in the sale of cold-finished steel bars for several years, and, last October, a modified plan was introduced for hot-rolled bars. This has been largely satisfactory to both buyers and sellers, but further revisions are expected to be announced with regard to hot-rolled bars when the plan is extended to flat-rolled products. Tin plate will not be affected.

As mills are unwilling to take orders for delivery during the second quarter, except at the current official price levels, until the contemplated new and revised extras are announced, this week's quotations on sheets and strip steel are largely nominal and subject to shading of \$3 a ton. THE IRON AGE composite price of finished steel is therefore unchanged at 2.109c. a lb.

IN some districts the desire of consumers to take advantage of current shaded prices has prompted the placing of heavy orders for March rolling. This is partially responsible for a further rise in steel ingot production, which is one point higher this week, at 56 per cent of capacity.

Output is unchanged in the important Pittsburgh and Chicago districts, but production is up five points to 65 per cent in the Valleys, one point to 41 per cent at Philadelphia, 14 points to 40 per cent at Buffalo and three points to 80 per cent in the lower Ohio River territory. Only at Cleveland are operations lower. Finishing mill schedules show a mixed trend, with tin plate output higher at 75 to 80 per cent of capacity and strip steel production off seven points to 38 per cent. On other products, no marked change is recorded.

THE trend of pig iron production in February was contrary to that of steel ingots. The exact gain in ingot output has not yet been announced, but daily production of pig iron declined $3\frac{1}{2}$ per cent, or from 65,351 gross tons in January to 63,034 tons in Feb-

ruary. Total production declined from 2,025,885 tons to 1,827,972 tons.

Part of the February loss in daily output may have been due to the difficulty of obtaining water shipments of fuel on icebound rivers. The trend of production has now been reversed as 121 stacks were making iron at a rate of 64,695 tons daily on March 1, compared with 117 furnaces producing 63,660 tons daily on Feb. 1. The gain in active units was all in the steel-making group.

THE first effect of milder weather is noticeable in the scrap market. While prices are still strong and supplies are not yet adequate, no important advances have occurred this week and THE IRON AGE scrap composite is unchanged at \$14.75 a gross ton. The pig iron composite is also maintained at \$18.84 a ton, and buying interest in second quarter requirements is growing.

Improved weather has also raised the hopes of automobile producers and announced March schedules are above February levels. Ford expects to build 100,000 units this month, having already increased operations to five days a week. This company released substantial steel tonnages in the last week. Chevrolet will probably build 50 per cent more cars this month than last and other companies plan considerable increases in output.

Miscellaneous demand for finished steel is increasing steadily and the prospect for improved building operations is good in all important districts. However, the week's fabricated structural steel lettings amount to only 14,000 tons, compared with 30,000 tons last week, and new projects call for only 11,350 tons, against 21,805 tons.

RAILROAD activity is the feature of the market in many areas. The Milwaukee Road has placed 29,000 tons of rails and the Nickel Plate, 6800 tons. The Norfolk & Western is inquiring for 20,000 tons and the Erie for 18,090 tons, while the Chesapeake & Ohio is soon expected to come into the market for 20,000 tons. The Norfolk & Western is also building 1000 hopper cars and five locomotives in its own shops, while locomotive builders have an inquiry from the New Haven for 15 locomotives.

Demand for machine tools and related industrial equipment, which was much stronger in the past week, is also developing considerable demand for special steels.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous;
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	Mar. 3, 1936	Feb. 25, 1936	Feb. 4, 1936	Mar. 5, 1935
No. 2 fdy., Philadelphia.....	\$21.3132	\$21.3132	\$21.3132	\$20.26
No. 2, Valley furnace.....	19.50	19.50	19.50	18.50
No. 2 Southern, Cin'ti.....	20.2007	20.2007	20.2007	19.13
No. 2, Birmingham†.....	15.50	15.50	15.50	14.50
No. 2 foundry, Chicago*.....	19.50	19.50	19.50	18.50
Basic, del'd eastern Pa.....	20.8132	20.8132	20.8132	19.76
Basic, Valley furnace.....	19.00	19.00	19.00	18.00
Malleable, Chicago*.....	19.50	19.50	19.50	18.50
Malleable, Valley.....	19.50	19.50	19.50	18.50
L. S. charcoal, Chicago.....	25.2528	25.2528	25.2528	24.04
Ferromanganese, seab'd car- lots	75.00	75.00	75.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Finished Steel

Per Lb.:	Mar. 3, 1936	Feb. 25, 1936	Feb. 4, 1936	Mar. 5, 1935
Cents	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Gary.....	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh. .	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary...	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.85
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.95
Wire nails, Pittsburgh.....	2.10	2.10	2.40	2.60
Wire nails, Chicago dist. mill.	2.15	2.15	2.45	2.65
Plain wire, Pittsburgh.....	2.30	2.30	2.30	2.30
Plain wire, Chicago dist. mill.	2.35	2.35	2.35	2.35
Barbed wire, galv., Pittsburgh	2.50	2.50	2.80	3.00
Barbed wire, galv., Chicago dist. mill.....	2.55	2.55	2.85	3.05
Tin plate, 100 lb. box, P'gh..	\$5.25	\$5.25	\$5.25	\$5.25

Rails, Billets, etc.

Per Gross Ton:	Mar. 3, 1936	Feb. 25, 1936	Feb. 4, 1936	Mar. 5, 1935
Rails, heavy, at mill.....	\$36.37½	\$36.37½	\$36.37½	\$36.37½
Light rails, Pittsburgh.....	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh..	29.00	29.00	29.00	27.00
Sheet bars, Pittsburgh.....	30.00	30.00	30.00	28.00
Slabs, Pittsburgh.....	29.00	29.00	29.00	27.00
Forging billets, Pittsburgh...	35.00	35.00	35.00	32.00
Wire rods, Pittsburgh.....	40.00	40.00	40.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb....	1.80	1.80	1.80	1.70

Scrap

Per Gross Ton:	Mar. 3, 1936	Feb. 25, 1936	Feb. 4, 1936	Mar. 5, 1935
Heavy melting steel, P'gh.....	\$15.75	\$15.75	\$14.50	\$12.75
Heavy melting steel, Phila....	13.75	13.75	12.75	11.00
Heavy melting steel, Ch'go....	14.75	14.75	13.75	10.75
Carwheels, Chicago.....	14.00	14.00	13.00	11.00
Carwheels, Philadelphia.....	14.75	14.75	14.75	12.50
No. 1 cast, Pittsburgh.....	14.25	14.25	14.25	13.25
No. 1 cast, Philadelphia.....	14.25	13.75	13.00	11.00
No. 1 cast, Ch'go (net ton)...	13.50	13.50	12.00	9.50
No. 1 RR. wrot., Phila.....	13.25	13.25	13.25	11.00
No. 1 RR. wrot., Ch'go (net)...	13.25	13.25	12.00	8.75

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.85	1.85	1.85	1.80
Bars, Chicago.....	1.90	1.90	1.90	1.85
Bars, Cleveland.....	1.90	1.90	1.90	1.85
Bars, New York.....	2.20	2.20	2.20	2.13
Plates, Pittsburgh.....	1.80	1.80	1.80	1.80
Plates, Chicago.....	1.85	1.85	1.85	1.85
Plates, New York.....	2.09	2.09	2.09	2.08
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago...	1.85	1.85	1.85	1.85
Structural shapes, New York...	2.06¼	2.06¼	2.06¼	2.05¼
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh..	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh.	2.60	2.60	2.60	2.60

Coke, Connellsville

Per Net Ton at Oven:	Mar. 3, 1936	Feb. 25, 1936	Feb. 4, 1936	Mar. 5, 1935
Furnace coke, prompt.....	\$3.65	\$3.65	\$3.65	\$3.85
Foundry coke, prompt.....	4.25	4.25	4.25	4.60

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn....	9.25	9.25	9.25	8.75
Lake copper, New York.....	9.37½	9.37½	9.37½	9.12½
Tin (Straits), New York....	48.00	47.62½	48.00	47.37½
Zinc, East St. Louis.....	4.90	4.90	4.85	3.90
Zinc, New York.....	5.27½	5.27½	5.22½	4.25
Lead, St. Louis.....	4.45	4.35	4.35	3.40
Lead, New York.....	4.60	4.50	4.50	3.55
Antimony (Asiatic), N. Y....	13.25	13.25	12.87½	14.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

Finished Steel

March 3, 1936	2.109c. a Lb.
One week ago	2.109c.
One month ago	2.109c.
One year ago	2.124c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.

	HIGH	LOW
1936	2.130c., Jan. 7	2.109c. Feb. 4
1935	2.130c., Oct. 1	2.124c., Jan. 8
1934	2.199c., April 24	2.008c., Jan. 2
1933	2.015c., Oct. 3	1.867c., April 18
1932	1.977c., Oct. 4	1.926c., Feb. 2
1931	2.037c., Jan. 13	1.945c., Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29
1928	2.286c., Dec. 11	2.217c., July 17
1927	2.402c., Jan. 4	2.212c., Nov. 1

Pig Iron

\$18.84 a Gross Ton
18.84
18.84
17.90

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	HIGH	LOW
1936	18.84, Jan. 7	18.84, Jan. 7
1935	18.84, Nov. 5	17.83, May 14
1934	17.90, May 1	16.90, Jan. 27
1933	16.90, Dec. 5	13.56, Jan. 3
1932	14.81, Jan. 5	13.56, Dec. 6
1931	15.90, Jan. 6	14.79, Dec. 15
1930	18.21, Jan. 7	15.90, Dec. 16
1929	18.71, May 14	18.21, Dec. 17
1928	18.59, Nov. 27	17.04, July 24
1927	19.71, Jan. 4	17.54, Nov. 1

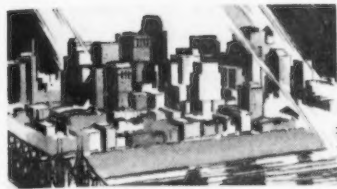
Steel Scrap

\$14.75 a Gross Ton
14.75
13.67
11.50

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
1936	14.75, Feb. 25	13.33, Jan. 7
1935	13.42, Dec. 10	10.33, April 23
1934	13.00, Mar. 13	9.50, Sept. 26
1933	12.25, Aug. 8	6.75, Jan. 3
1932	8.50, Jan. 12	6.43, July 5
1931	11.33, Jan. 6	8.50, Dec. 29
1930	15.00, Feb. 18	11.25, Dec. 9
1929	17.58, Jan. 29	14.08, Dec. 3
1928	16.50, Dec. 31	13.08, July 2
1927	15.25, Jan. 11	13.08, Nov. 22

Ingot Output Holding at Pittsburgh and Wheeling



Valley Production Rises Five Points to 65 Per Cent of Capacity—Changes in Finished Steel Extras Contemplated

PITTSBURGH, March 3.—While demand for some classes of flat-rolled steel has increased, fresh calls for heavy hot-rolled products and strip steel are temporarily dragging. A surprisingly well-sustained demand for tin plate is perhaps a marked influence in offsetting a decline in the total movement of steel in this district.

As reflected in ingot output, activity in the Pittsburgh district is steady at 39 per cent of capacity. Improved demand for flat-rolled steel from miscellaneous sources in the Valleys and nearby northern Ohio territory has stimulated a five-point advance in ingot production to 65 per cent of capacity. Output in the Wheeling district is holding at 80 per cent.

A minor advance is scheduled this week for tin plate production, which will average between 75 and 80 per cent, while sheet mill schedules are sustained at 65 per cent. Strip output is moving contrary to the general trend, with a drop of seven points to 38 per cent.

Steel producers have not announced second quarter prices but will likely open their books officially within a few days. In cases where delivery in early April makes immediate rolling imperative, orders are being accepted at full base prices. Under serious consideration is a system of quoting quantity extras and deductions on a number of steel products now on a uniform price basis regardless of quantity. Although no public announcements have been made, it is hinted rather strongly that when prices are established for second quarter the new schedules will be introduced to clear up the widespread irregularities that have depressed the entire market in recent weeks.

Pig Iron

Producers still have not announced second quarter prices, but it is quite well established that no changes will be made for that period. With the market still on a hand-to-mouth basis, little or no

interest is being shown in forward delivery. Large buyers are well covered and have not suffered from the lack of water deliveries during the past month.

Semi-Finished Steel

Pending announcement of second quarter quotations, current published prices for semi-finished grades remain nominal. Practically all shipments are being billed at prices ruling prior to the advances last fall. The movement of semi-finished steel in the past week increased measurably. While the increase may be attributable partly to heavier detached mill demand, it also is likely that some consumers are covering in anticipation of a firmer market when second quarter prices are announced.

Bars

Aggregate demand is practically unchanged. Shipments to automotive channels are not showing any tendency to increase, although producers look for an early pick-up in this business. Agricultural implement makers likewise are lagging in their demands, while miscellaneous tonnage comprises the bulk of the current movement. Strenuous efforts to overcome weakness in prices in certain areas are evidently bearing fruit, and the Pittsburgh base remains quite firm. Second quarter quotations may be announced some time this week.

Bolts, Nuts and Rivets

Current discounts will apply to second quarter, and producers are now accepting business for that period. The only change in prices will be the elimination of a 10 per cent discount allowed jobbers for shipment to warehouse stock. Prices to jobbers and consumers will now be on the same basis. Demand from railroad car builders is the only feature in the current market.

Reinforcing Steel

All producers in this district are now allowing jobbers only 10c. a 100 lb., instead of 20c., on ship-

ments direct to jobbers' customers. Effective March 1 for application through second quarter, stock lengths for shipment to jobbers' stock only are 1.75c., Pittsburgh, and 1.80c., Chicago, Birmingham and Buffalo; cut lengths for shipment to jobbers and warehouses are 1.85c., Pittsburgh, and 1.90c. other basing points; for shipment to jobbers' customers, 1.95c., Pittsburgh, and 2.00c. other basing points. Billet steel reinforcing in straight lengths quoted by distributors are quoted uniformly at 2.05c., Pittsburgh.

Cold-Finished Bars

Demand is drifting, with automotive tonnage still in reduced volume. Miscellaneous business remains the mainspring in this market. Prices for second quarter probably will be announced this week.

Sheet Steel Piling

Although official announcement of second quarter prices has not been made, it is expected that the present Pittsburgh base of 2.15c. will be reaffirmed. The TVA has called for bids on 1000 tons of used piling for the Guntersville Dam, for delivery at Sheffield or Hobbs Island, Ala.

Plates and Shapes

The plate market remains dull, with no large barge construction work imminent. Releases from railroad car builders are accounting for a rather limited flow of shipments at present. Spring activity is expected to stimulate a call for tank construction, while increased interest in pipe lines may lead to business later on.

The volume of fabricated structural steel awards is well sustained. The American Bridge Co. has received contract covering 6300 tons for ring beams and purlins for the Fort Peck, Mont., project. The Mesta Machine Co., Homestead, Pa., has placed 215 tons for machine shop extension. Private projects seem to be increasing in number, although tonnage requirements are individually small. State highway bridge construction predominates the list of new inquiries.

Base quotations for plates and shapes, while not officially extended for second quarter, are expected to be reaffirmed.

Tubular Products

Producers have not officially opened books for second quarter, but there is little likelihood of any change in current discount cards for the coming period. Meanwhile demand fluctuates negligibly from week to week, with the movement of oil-country goods still leading.

Operations in this district are sustained at about 45 per cent of capacity.

Wire Products

Prospective announcement of second quarter prices this week may reflect a more general inclination among producers to remedy recent price irregularities on wire nails. Just what remedial steps will be taken, however, has not been indicated. No change for the coming quarter is expected in the quotations for bright wire and spring wire for the manufacturing trade. Pending clarification of prices, consumers are limiting their orders to immediate requirements.

Sheets

Automotive demand is showing signs of vigor, with one producer reporting volume of such business at a practically "normal" percentage of total tonnage. A further slight increase also is noticeable in miscellaneous sheet orders. Demand from refrigerator manufacturers also is showing up well. Operations are holding at 65 per cent of capacity, with strong possibilities of a pick-up within the next fortnight. Announcement of second quarter prices this week may disclose a new method of quoting, with quantity differentials a salient feature of the new set-up. In any event, a firmer price foundation for second quarter appears to be gaining credence, and consumers already are feeling out the market in anticipation of more uniformly established base quotations for the coming quarter.

Tin Plate

Export orders divided honors with domestic business in the past week. In one instance, hot-rolled operations have been stepped up moderately, and the average for

the industry this week will range between 75 and 80 per cent of capacity. General line can and packers' requirements, with the possible exception of fruit packers', are in good evidence. At the same time, mill stocks are being pared very gradually, and as a consequence, mills are operating on extremely meager backlogs at the present rate. In most instances, cold reducing operations are at capacity.

Strip Steel

Demand in the past week did not hold the improvement scored in the preceding period, and hot-rolled strip production has fallen about seven points to 38 per cent of capacity. Cold-rolled schedules are running a little better. A slump in demand last week was difficult to trace to any classified source. Consumers are showing a tendency to await further important coverage until announcement of second quarter prices, which may correct some of the recent irregularities in quoting in certain areas.

Scrap

Resumption of river traffic and more favorable weather conditions, while loosing the flow of scrap in this district, have not yet exerted a depressing influence on prices. No. 1 steel at \$16, delivered, seems to be well supported by dealer bidding to cover unfilled orders. Little scrap is coming out at offers of as high as \$15.75, and bidding for the No. 1 steel on the current Pennsylvania list is expected to be lively. Scrap moving from outlying districts to the Pittsburgh area must be purchased by local brokers at prices that will prevent diversion to other nearby districts, including Wheeling, Weirton, Steubenville, Cleveland and Youngstown, where demand is

strong. In other words, Pittsburgh scrap quotations are absorbing a goodly share of their strength from conditions in other markets. Cast iron borings are \$1 a ton higher on recent transactions. Low phosphorus specialties also are higher.

Coal and Coke

A premature, though temporary, appearance of spring weather last week has caused a drastic recession in demand for domestic coal and coke. A consequent drop has occurred in Fairmont domestic lump coal, which is selling 30c. to 45c. a ton lower at around \$2, mines. Domestic sizes in the Panhandle district are quotable at \$2.50. Heating coke prices, which failed to rise as rapidly as those for domestic coal, have not been so drastically affected. Fuel is moving more freely by water, and water shipments from "captive" mines are now replacing largely emergency rail shipments during the recent sub-zero weather. Slack accumulations are a bit unwieldy as a result of heavy screenings of domestic sizes during the winter months.

Theory, technique, and advantages of bronze-welding and bronze-surfacing are summarized in a 10-page booklet, "How to Bronze-Weld," issued by the Linde Air Products Co., 30 East Forty-second Street, New York. Topics covered include: welding rods; preheating; bronze-welding of cast, malleable and wrought irons, carbon steels, alloys, galvanized iron and steel, sheet metal, copper, brass and bronze, nickel and Monel metal; and the joining of dissimilar metals. Procedure to be used in each case is outlined.

Weekly Indications of Steel Activity

FROM THE IRON AGE

	Mar. 3, 1936	Feb. 25, 1936	Feb. 4, 1936	Mar. 5, 1935	Average Year to Date	
					1936	1935
Steel ingot operations—Per cent of capacity	56.0	55.0	52.0	48.5	52.2	50.3
	Week Ended				Year to Date	
	Mar. 3, 1936	Feb. 25, 1936	Feb. 4, 1936	Mar. 5, 1935	1936	1935
Fabricated structural steel awards.....	14,000	25,950	16,400	9,300	189,785	123,905
Fabricated plate awards.....	2,215	7,650	0	2,800	65,667	47,765
Sheet steel piling awards.....	0	7,685	0	0	14,045	4,300
Reinforcing bar awards.....	4,350	13,735	3,735	1,575	90,390	56,390

Large Projects Are Lacking on Coast

SAN FRANCISCO, March 2.—Call for bids at Tacoma, Wash., on a 48-in. pipe line featured the past week's activity which was marked by few lettings and inquiries. Specifications for the 18,990-ft. line include alternates for all steel or steel and lock-joint steel cylinder reinforced concrete pipe. The former will require 2050 tons of plates while the latter alternate will involve 900 tons of reinforcing rods, 400 tons of sheets and 250 tons of plates.

Future projects listed during the week include preliminary estimates on 2500 tons of sheet piling for the Imperial Dam in southern California and 1500 tons of plates for a unit of the Hetch Hetchy pipe line near San Francisco. Twin Falls, Idaho, will vote soon on a \$300,000 bond issue to finance the construction of 14½ miles of 24-in. pipe.

Jones & Loughlin Steel Corp. is reported to have taken 1100 tons of reinforcing bars for the General Motors assembly building at Los Angeles. Lettings of 300 tons of structural steel for a Sears, Roebuck building at Los Angeles and 583 tons of shapes for a State undercrossing at Salem, Ore., went to Minneapolis-Moline Power Implement Co. and Poole & McGonigle, respectively. Western Pipe & Steel Co. booked 625 tons of plates on projects at San Francisco and Inglewood, Cal.

Although the market appears to be quiet, contrasted to December's wild scramble for Governmental grants, its sound gain in strength is indicated by the improvement in industrial construction and re-equipment. Jobbers have felt this steady improvement.

Railroad Equipment

Norfolk & Western will spend \$5,000,000 on improvements, including construction of 1000 coal cars and five Mallet locomotives at its shops in Roanoke, Va., also for extension of yards at Roanoke and Williamson, W. Va., and additional sidings and yard facilities on Buchanan branch.

Milwaukee Road has received permission to spend \$453,000 for air conditioning a number of passenger cars, \$1,507,000 for repairing culverts and 652 bridges, and \$2,154,000 for widening cuts and for signals.

Missouri Pacific will spend about \$918,000 for air conditioning 93 passenger cars, 60 of which are road owned and 33 owned by Pullman-Standard Car & Mfg. Co.

Northern Pacific is inquiring for a number of 50-ton convertible ballast cars.

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London, England

California Dispatch Line has placed five tank cars with American Car & Foundry Co.

Chicago Surface Lines have ordered 83 street cars from St. Louis Car Co.

RAILS

Norfolk & Western will purchase 20,000 tons of rails.

Erie has applied for PWA loan of \$1,100,000, of which \$1,098,199 will be spent for 18,090 tons of first quality rails, 1175 tons of second quality rails and other track material.

Milwaukee Road will spend \$2,116,000 for rails, \$692,000 for rail fastenings and \$523,000 for ballast. This road has ordered 21,000 tons of rails from Carnegie-

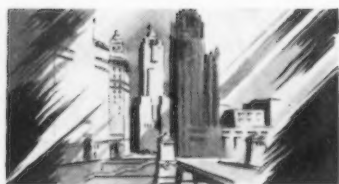
Illinois Steel Corp. and 8000 tons from the Inland Steel Co.

Belt Railway of Chicago has placed 800 tons of rails with Carnegie-Illinois Steel Corp.

Nickel Plate Railroad has placed 6800 tons of rails, 4500 with Carnegie-Illinois Steel Corp., 1500 with Inland Steel Co. and 800 with Bethlehem Steel Corp.

General Tin Plate Corp., Brooklyn, recently organized, has leased floor in building at 3611 Fourteenth Avenue for warehouse purposes, handling tin plate, sheet steel, etc. Officers of the company are Guy C. Carr, Fred J. Treiber, Joseph Altman and Benjamin E. Swartz who were formerly connected with Stieglitz-Treiber Co., New York.

Steel Sales Improved In Chicago Territory



Ingot Production Unchanged at 63
Per Cent of Capacity—Rail Or-
ders Continue—Strength in Scrap
Maintained

CHICAGO, March 3.—Sales of finished steel, strongly influenced by the addition of rail tonnages previously announced, show marked improvement. On the other hand, specifications remain on an even keel and consequently ingot production is unchanged from a week ago.

A broader spread of the buying base awaits settlement of prices, which are still badly mixed. There is no clarification in the wire market and flat-rolled products are still quotable by a spread of \$3 a ton. In the Chicago district, reinforcing bars are on a firmer base and early tests are expected to prove its stability.

The scrap market, after showing weakness at the first signs of a quick thaw, regained strength and a small lot of heavy melting steel moved at \$16. Afterward the market stabilized at \$15, delivered, for that grade.

The railroads are entering the wire market and those car programs which have been announced are active. Government expenditures for structural materials are growing as Midwestern States resume taking bids on bridges and overhead crossings. Architects' boards indicate that more private building work will make its appearance in the spring. Machinery builders are more active in the bar market and they freely predict that this year's business will top 1935 by a substantial margin.

Pig Iron

Second quarter books are open and prices are unchanged. Melters' stocks acquired in December are fast disappearing and sales have started to climb. Releases are growing and March shipments are expected to be heavy.

Coke

March delivery prices are unchanged at \$9 a ton for delivery outside of the switching district.

Shipments are in good volume and they promise to expand as the month advances.

Cast Iron Pipe

The bulk of going business results from State procurement orders, all of which call for small tonnages. Private interest is lacking and sellers are at a loss to find large tonnages no matter where they seek them. Contractors are still handicapped as the result of the severe winter and it may be three to four weeks before releases in quantity will again reach foundries. Prices are firm on all current quotations.

Reinforcing Bars

Prices being used on new quotations are being taken from the tops of spreads on both rail and billet steel reinforcing bars, and old low-priced quotations were withdrawn effective Mar. 2. A week to 10 days should afford tests of these efforts to strengthen prices. Mild weather is bringing contractors into the market for paving bars, and Middlewestern States are again starting to issue inquiries for paving work which can be started in six to eight weeks. The week's awards include two private projects which call for a total of 800 tons, and other similar work is taking shape.

Bars

Both sales and specifications show improvement and prospects for the future are considered good. Demand from the automobile trade is spotty, but orders are turning upward as some automobile plants start to anticipate March production. The agricultural implement group is holding production near capacity and many within that trade predict that there will be no let-up for 60 to 90 days. Tractor builders have purchased bar mill products heavily within the week and machinery builders are on the verge of taking more steel based

on anticipated orders from the railroads, automobile plants and the Government, including the requirements of the Navy. The machinery trade is expecting a year that will be decidedly better than 1935.

Structural Material

The Metropolitan Water District of Los Angeles has placed 32,000 tons of plates and reinforcing bars. Both awards and inquiries in the immediate Chicago district are light and they fall in the public money class. However, there is a greater number of jobs of less than 100 tons each, and the prospect for more private work remains good. Illinois, Indiana and Wisconsin are in the market for bridges and overhead crossings, and Illinois is now disposing of old bids that have been permitted to hang fire during the winter months.

Sheets

Prices are still variable and range downward \$3 a ton from recent quotations. Improvement is noted in the tonnage going to miscellaneous users and it is reported here that some sizable business has been placed by automobile builders. Farm area use of roofing sheets is promising now that the worst of the winter weather is past.

Wire Products

Prices still remain in a demoralized condition and books for second quarter remain closed. There is no pressure by buyers to make new commitments and sellers are hopeful that prices can be put on a better basis before books must be opened. Although floods are menacing some areas, the general tendency of jobber demand is upward and railroads are contributing to a more active wire business. Automobile plants are buying for March production. Shipments more nearly balance production, though there are still large quantities of staple wire products going into mill warehouses.

Plates

The Chicago Surface Lines have ordered 83 street cars from the St. Louis Car Co. Railroad equipment building programs are still taking rapid shape and substantial steel orders are expected in the very near future. Tank and pipe business is slow except for previously announced projects which are rapidly reaching the contract stage.

Rails

The Milwaukee Road has placed 21,000 tons of rails with Carnegie-Illinois and 8000 tons with Inland

Steel Co. The Belt Railway of Chicago has ordered 800 tons and the Chicago & Eastern Illinois is expected to enter the market at an early date. Accessory orders, mostly for the New York Central, total over 2000 tons, and more of this business will reach mills as the season advances and rail-laying programs swing into full activity.

Scrap

Weakness in scrap, apparent a week ago, has disappeared, and once again the price trend is upward in a market that has fully discounted the end of sharp and severe winter weather. The thaw which came fast and unexpectedly resulted in only a moderate increase in shipments and many consumers are still scrambling for needed tonnages. This is particularly true of malleable grades. The need for malleable scrap is well illustrated by the fact that wrecking an industrial plant has been stopped in order that the malleable shop, which was soon to be pulled apart, can go back into production. Steel mills are taking all heavy melting steel that comes on track and are scarcely getting their requirements.

Cast Iron Pipe

Andover, Mass., plans pipe lines for water system in number of streets, work to begin early in spring. Cost over \$60,000. Board of Public Works is in charge.

Harwich, Mass., will soon take bids for pipe for extension in water system from Chatham line to Dennis line; also for elevated steel tank, pumping station and other waterworks installation. Cost close to \$200,000. Whitman & Howard, 89 Broad Street, Boston, are consulting engineers.

Board of Water Commissioners, Glens Falls, N. Y., asks bids until March 16 for pipe lines in connection with new dam and water pumping station on Halfway Brook, for which bids close at same time. Entire project will cost about \$120,354.

Goshen, N. Y., asks bids until March 19 for about 24,000 ft. of 6 and 8-in. in number of streets for replacements in water lines, including valves, fittings, etc. Complete project will cost about \$63,687. Financing has been arranged through Federal aid.

Board of Pinellas County Commissioners, Clearwater, Fla., plans pipe lines for water system in beach district in lower part of county. Fund of \$275,000 has been arranged, through Federal aid for this and other waterworks installation in that area.

Board of Wise County Supervisors, Wise, Va., closes bids March 12 for various sizes for water supply; also for 75,000-gal. storage tank and other waterworks equipment. Wiley & Wilson, Lynchburg, Va., are engineers.

Concord, N. C., closes bids March 11 for about five miles of 12 and 18-in. for main trunk line for water system; also for 500,000-gal. elevated steel tank and tower, centrifugal pumping units and accessories, and other waterworks equipment. Gilbert C. White Co., Durham, N. C., is consulting engineer.



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Jeanerette, La., will soon take bids for pipe for water system and other waterworks installation. Cost about \$55,000. Financing has been arranged. J. B. McCrary Co., Atlanta, Ga., is consulting engineer.

Rensselaer, Ind., closes bids March 9 for about 3600 ft. of 4-in. and smaller quantities of larger size for water system extensions; also for other municipal work, including underground lines for electrical system. Charles Brossman, Chamber of Commerce Building, Indianapolis, is consulting engineer.

Manitowoc, Wis., plans pipe lines for water system in connection with development of new underground source of supply. W. G. Kirchoffer, 22 North Carroll Street, Madison, Wis., is consulting engineer.

Adams, Neb., plans pipe lines for extension of water system in Southeastern part of municipality. Financing has been secured through Federal aid.

Treasury Department, Oakland, Cal., has awarded 180 tons of 18-in. to United States Pipe & Foundry Co.

Treasury Department, San Diego, Cal., has placed 200 tons of 6 and 8-in. with an unnamed bidder.

Los Angeles Water Department has placed 100 tons of 2-in. with Crane Co.

Multnomah, Ore., has opened bids on 190 tons of 8 and 12-in.

The Youngstown Sheet & Tube Co. has blown out its Hubbard, Ohio, furnace for an indefinite period. Hot iron for the Valley Mould & Iron Co. plant, it is planned, will be conveyed in ladle cars from Campbell works. The blast furnace "B" at Campbell, which is under reconstruction, is not expected to be ready until the middle of March, owing to interference of cold weather.



86—THE IRON AGE, March 5, 1936

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel		Base per Lb.
F.o.b. Pittsburgh	.....	1.85c.
F.o.b. Chicago	.....	1.90c.
F.o.b. Gary	.....	1.90c.
F.o.b. Duluth	.....	2.00c.
Del'd Detroit	.....	2.00c.
F.o.b. Cleveland	.....	1.90c.
F.o.b. Buffalo	.....	1.95c.
Del'd Philadelphia	.....	2.16c.
Del'd New York	.....	2.20c.
F.o.b. Birmingham	.....	2.00c.
F.o.b. cars dock Gulf ports	.....	2.25c.
F.o.b. cars dock Pacific ports	.....	2.40c.

Rail Steel

(For merchant trade)		
F.o.b. Pittsburgh	.....	1.70c.
F.o.b. Chicago	.....	1.75c.
F.o.b. Gary	.....	1.75c.
F.o.b. Moline, Ill.	.....	1.75c.
F.o.b. Cleveland	.....	1.75c.
F.o.b. Buffalo	.....	1.80c.
F.o.b. Birmingham	.....	1.85c.
F.o.b. cars dock Gulf ports	.....	2.10c.
F.o.b. cars dock Pacific ports	.....	2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)		
F.o.b. Pittsburgh	.....	1.85c. to 2.05c.
F.o.b. Chicago	.....	1.90c. to 2.10c.
F.o.b. Gary	.....	1.90c. to 2.10c.
Del'd Detroit	.....	2.00c. to 2.20c.
F.o.b. Cleveland	.....	1.90c. to 2.10c.
F.o.b. Youngstown	.....	1.90c. to 2.10c.
F.o.b. Buffalo	.....	1.90c. to 2.10c.
F.o.b. Birmingham	.....	1.90c. to 2.10c.
F.o.b. cars dock Gulf ports	.....	2.10c.
F.o.b. cars dock Pacific ports	.....	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)		
F.o.b. Pittsburgh	.....	1.70c. to 1.90c.
F.o.b. Chicago	.....	1.75c. to 1.95c.
F.o.b. Gary	.....	1.75c. to 1.95c.
F.o.b. Cleveland	.....	1.75c. to 1.95c.
F.o.b. Youngstown	.....	1.75c. to 1.95c.
F.o.b. Buffalo	.....	1.75c. to 1.95c.
F.o.b. Birmingham	.....	1.75c. to 1.95c.
F.o.b. cars dock Gulf ports	.....	2.10c.
F.o.b. cars dock Pacific ports	.....	2.30c.

Iron

F.o.b. Chicago	.....	1.80c.
F.o.b. Pittsburgh (refined)	.....	2.10c.
Delivered New York	.....	2.05c.
Delivered Philadelphia	.....	2.10c.

Cold Finished Bars and Shafting*

Base per Lb.		
F.o.b. Pittsburgh	.....	2.10c.
F.o.b. Chicago	.....	2.15c.
F.o.b. Gary	.....	2.15c.
F.o.b. Cleveland	.....	2.15c.
F.o.b. Buffalo	.....	2.20c.
Del'd Detroit	.....	2.30c.
Del'd eastern Michigan	.....	2.35c.

* In quantities of 10,000 to 19,999 lb.

Fence and Sign Posts

Angle Line Posts

Base per Net Ton		
F.o.b. Pittsburgh	.....	\$54.00
F.o.b. Chicago	.....	54.00
F.o.b. Duluth	.....	55.00
F.o.b. Cleveland	.....	54.00
F.o.b. Birmingham	.....	57.00
F.o.b. Houston, Orange, Beaumont, Galveston	.....	63.00
F.o.b. Mobile	.....	62.00
F.o.b. New Orleans, Lake Charles, Corpus Christi	.....	63.00
F.o.b. cars dock Pacific ports	.....	67.00

Plates

Base per Lb.		
F.o.b. Pittsburgh	.....	1.80c.
F.o.b. Chicago	.....	1.85c.
F.o.b. Gary	.....	1.85c.
Del'd Cleveland	.....	1.90c.
F.o.b. Coatesville	.....	1.90c.
F.o.b. Sparrows Point	.....	1.90c.
Del'd Philadelphia	.....	1.95c.
Del'd New York	.....	2.00c.
F.o.b. Birmingham	.....	2.05c.
F.o.b. cars dock Gulf ports	.....	2.20c.
F.o.b. cars dock Pacific ports	.....	2.35c.
Wrought iron plates, f.o.b. P'gh	.....	3.20c.

Floor Plates

F.o.b. Pittsburgh	.....	3.35c.
F.o.b. Chicago	.....	3.40c.
F.o.b. Coatesville	.....	3.45c.
F.o.b. cars dock Gulf ports	.....	3.75c.
F.o.b. cars dock Pacific ports	.....	3.90c.

Structural Shapes

Base per Lb.		
F.o.b. Pittsburgh	.....	1.80c.
F.o.b. Chicago	.....	1.85c.
Del'd Cleveland	.....	1.95c.
F.o.b. Bethlehem	.....	1.90c.
Del'd Philadelphia	.....	1.90c.
Del'd New York	.....	2.05c.
F.o.b. Birmingham (standard)	.....	1.95c.
F.o.b. cars dock Gulf ports	.....	2.20c.
F.o.b. cars dock Pacific ports	.....	2.35c.

Steel Sheet Piling

Base per Lb.		
F.o.b. Pittsburgh	.....	2.15c.
F.o.b. Chicago	.....	2.25c.
F.o.b. Buffalo	.....	2.25c.
F.o.b. cars dock Gulf ports	.....	2.60c.
F.o.b. cars dock Pacific ports	.....	2.60c.

SHEETS, STRIP, TIN PLATE

Sheets

Hot Rolled

Base per Lb.		
No. 10, f.o.b. Pittsburgh	.....	1.85c.
No. 10, f.o.b. Gary	.....	1.95c.
No. 10, del'd Detroit	.....	2.05c.
No. 10, del'd Phila.	.....	2.16c.
No. 10, f.o.b. Birmingham	.....	2.10c.
No. 10, f.o.b. cars dock Pacific ports	.....	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	.....	2.40c.
No. 24, f.o.b. Gary	.....	2.50c.
No. 24, del'd Detroit	.....	2.60c.
No. 24, del'd Phila.	.....	2.71c.
No. 24, f.o.b. Birmingham	.....	2.55c.
No. 24, f.o.b. cars dock Pacific ports	.....	3.05c.
No. 24, wrought iron, Pittsburgh	.....	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	.....	2.50c.
No. 10 gage, f.o.b. Gary	.....	2.60c.
No. 10 gage, f.o.b. Detroit	.....	2.55c.
No. 10 gage, del'd Phila.	.....	2.81c.
No. 10 gage, f.o.b. Birmingham	.....	2.85c.
No. 10 gage, f.o.b. cars dock Pacific ports	.....	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	.....	2.95c.
No. 20 gage, f.o.b. Gary	.....	3.05c.
No. 20 gage, del'd Detroit	.....	3.15c.
No. 20 gage, del'd Phila.	.....	3.26c.
No. 20 gage, f.o.b. Birmingham	.....	3.10c.
No. 20 f.o.b. cars dock Pacific ports	.....	3.50c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	.....	3.10c.
No. 24, f.o.b. Gary	.....	3.20c.
No. 24, del'd Phila.	.....	3.41c.
No. 24, f.o.b. Birmingham	.....	3.25c.
No. 24, f.o.b. cars dock Pacific ports	.....	3.70c.
No. 24, wrought iron, Pittsburgh	.....	4.35c.

Long Terns

No. 24, unassorted 8-lb. coating	.....
f.o.b. Pittsburgh	.....	3.40c.
F.o.b. Gary	.....	3.50c.
F.o.b. cars dock Pacific ports	.....	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	.....	3.10c.
No. 20, f.o.b. Gary	.....	3.20c.
No. 20, f.o.b. Birmingham	.....	3.70c.
No. 20, f.o.b. cars dock Pacific ports	.....	3.70c.
No. 10, f.o.b. Pittsburgh	.....	2.50c.
No. 10, f.o.b. Gary	.....	2.60c.
No. 10, f.o.b. Birmingham	.....	3.10c.
No. 10, f.o.b. cars dock Pacific ports	.....	3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	.....	2.75c.
No. 28, Gary	.....	2.85c.
No. 28, cars dock Pacific Coast	.....	3.35c.

Tin Plate

Base per Box		
Standard cokes, f.o.b. P'gh district mill	.....	\$5.25
Standard cokes, f.o.b. Gary	.....	5.35
Standard cokes, f.o.b. cars dock Pacific ports	.....	5.90

Terne Plate

(F.o.b. Pittsburgh)

8-lb. coating I.C.	.....	\$10.00
15-lb. coating I.C.	.....	12.00
20-lb. coating I.C.	.....	13.00
25-lb. coating I.C.	.....	14.00
30-lb. coating I.C.	.....	15.25
40-lb. coating I.C.	.....	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 In.

Base per Lb.		
All widths up to 24 in., P'gh	.....	1.85c.
All widths up to 24 in., Chicago	.....	1.95c.
All widths up to 24 in., del'd Detroit	.....	2.05c.
All widths up to 24 in., Birmingham	.....	2.00c.
Cooperage stock, Pittsburgh	.....	1.95c.
Cooperage stock, Chicago	.....	2.05c.

Cold-Rolled Strips

Base per Lb.		
F.o.b. Pittsburgh	.....	2.60c.
F.o.b. Cleveland	.....	2.60c.
Del'd Chicago	.....	2.85c.
F.o.b. Worcester	.....	2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland	.....	2.90c.
No. 14, Worcester	.....	3.30c.
No. 24, Pittsburgh or Cleveland	.....	3.30c.
No. 20, Worcester	.....	3.70c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade		Per. Lb.
Bright wire	.....	2.30c.
Spring wire	.....	2.90c.

Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.

To the Trade

Base per Keg		
Standard wire nails	.....	\$2.10 to \$2.40
Smooth coated nails	.....	2.10 to 2.40

Base per 100 Lb.

Annealed fence wire	.....	\$2.15 to \$2.45
Galvanized fence wire	.....	2.50 to 2.80
Polished staples	.....	3.05 to 3.10
Galvanized staples	.....	3.05 to 3.35
Barbed wire, galvanized	.....	2.50 to 2.80
Twisted barless wire	.....	2.50 to 2.80
Woven wire fence, base column	.....	61.00
Single loop bale ties, base column	.....	53.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh except for woven wire fence, which is \$3 over Pittsburgh, and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh, while Pacific Coast prices are \$8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are \$11 a ton above Pittsburgh.

On staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

Wire Hoops, Twisted or Welded

OF List		
F.o.b. Pittsburgh	.....	45 off
F.o.b. Chicago	.....	43 1/2 off

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills
F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel		Wrought Iron	
Inches	Black Galv.	Inches	Black Galv.
1/4 to 3/8	51 1/2 29 1/2	1/4 to 3/8	51 1/2 29 1/2
1/2 to 3/4	53 1/2 35	1/2 to 3/4	53 1/2 35
3/4 to 1	58 1/2 47	3/4 to 1	58 1/2 47
1 to 1 1/4	62 52	1 to 1 1/4	62 52
1 1/4 to 3	64 55	1 1/4 to 3	64 55

Lap Weld

2	.....	60	51	2	.....	37	22 1/2
2 1/2 to 3	63	54	2 1/2 to 3	38	25		
3 1/2 to 6	65	56	4 to 8	40	28 1/2		
7 and 8	64	54	9 to 12	38	24 1/2		
9 and 10	63 1/2	53 1/2					
11 and 12	63 1/2	52 1/2					

Butt Weld, extra strong, plain ends

1/4 to 3/8	48 1/2 33 1/2	1/4 to 3/8	48 1/2 33 1/2
1/2 to 3/4	51 38	1/2 to 3/4	51 38
3/4 to 1	56 1/2 47 1/2	3/4 to 1	56 1/2 47 1/2
1 to 1 1/4	61 52	1 to 1 1/4	61 52
1 1/4 to 3	63 55	1 1/4 to 3	63 55

Lap Weld, extra strong, plain ends

2	.....	58	50	2	.....	40	26
2 1/2 to 3	62	54	2 1/2 to 3	45 1/2	33		
3 1/2 to 6	65 1/2	57 1/2	4 to 8	45	33 1/2		
7 and 8	64 1/2	54 1/2	9 to 12	46	33		
9 and 10	63 1/2	53 1/2					
11 and 12	63 1/2	52 1/2					

On butt-weld steel pipe two extra 5% discounts are allowed on sales to consumers while three 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less.

Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes
(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn		Hot Rolled	
		lb.		lb.	
1 in. o.d.	13 B.W.G.	\$ 8.60	\$ 7.82		
1 1/4 in. o.d.	13 B.W.G.	10.19	9.26		
1 1/2 in. o.d.	13 B.W.G.	11.26	10.33		
1 3/4 in. o.d.	13 B.W.G.	12.81	11.64		
2 in. o.d.	13 B.W.G.	14.35	13.04		
2 1/4 in. o.d.	13 B.W.G.	16.00	14.54		
2 1/2 in. o.d.	12 B.W.G.	17.61			
2 3/4 in. o.d.	12 B.W.G.	19.29	17.54		
3 in. o.d.	12 B.W.G.	21.45	19.50		
3 1/4 in. o.d.	10 B.W.G.	41.08	37.35		
3 1/2 in. o.d.	11 B.W.G.	27.09	24.63		
4 in. o.d.	10 B.W.G.	33.60	30.58		
4 1/2 in. o.d.	9 B.W.G.	41.98	38.35		
5 in. o.d.	9 B.W.G.	51.56	46.87		
6 in. o.d.	7 B.W.G.	79.15	71.90		

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List	
Machine and carriage bolts:	
1/2 in. x 1 in. and smaller.....	70 and 5
Larger than 1/2 in.	70 and 10
Lag bolts.....	70 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads.....	70 and 10
Hot-pressed nuts, blank or tapped.....	70 and 10
Hot-pressed nuts, blank or tapped, hexagon.....	70 and 10
C.p.c. and hex. nuts, blank or tapped.....	70 and 10
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes to and incl. 1 in. diameter.....	60, 20 and 15
Larger than 1 in. diameter.....	60, 20 and 15
Stove bolts in packages, Pittsburgh.....	72 1/2 and 10
Stove bolts in packages, Chicago.....	72 1/2 and 10
Stove bolts in packages, Cleveland.....	72 1/2 and 10
Stove bolts in bulk, Pittsburgh.....	82 1/2
Stove bolts in bulk, Chicago.....	82 1/2
Stove bolts in bulk, Cleveland.....	82 1/2
Tire bolts.....	55

Large Rivets (1/2-in. and larger)	
F.o.b. Pittsburgh or Cleveland.....	\$2.90
F.o.b. Chicago.....	3.00
F.o.b. Birmingham.....	3.05

Small Rivets (7/16-in. and smaller)	
F.o.b. Pittsburgh.....	70 and 5
F.o.b. Cleveland.....	70 and 5
F.o.b. Chicago and Birm'g'm.....	70 and 5

Cap and Set Screws	
(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)	
Per Cent Off List	
Milled cap screws, 1 in. dia. and smaller.....	80, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller.....	75
Milled headless set screws, cut thread 1/2 in. and smaller.....	75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller.....	85
Upset set screws, cut and oval points.....	75 and 10
Milled studs.....	65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Ingots
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped.....\$40 per gross ton

Alloy Steel Blooms, Billets and Slabs
F.o.b. Pittsburgh, Chicago, Canton Massillon, Buffalo, Bethlehem.
Base price, \$49 a gross ton.

Alloy Steel Bars
Price del'd Detroit is \$52.
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base.....2.45c.
Delivered price at Detroit is.....2.60c.
S.A.E. Alloy

Series	Differential per 100 lb.
Numbers	
2000 (1/2% Nickel).....	\$0.25
2100 (3/4% Nickel).....	0.35
2300 (3/4% Nickel).....	1.50
2500 (5% Nickel).....	2.25
3100 Nickel Chromium.....	0.55
3200 Nickel Chromium.....	1.35
3300 Nickel Chromium.....	3.80
3400 Nickel Chromium.....	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum).....	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum).....	0.70
4600 Nickel Molybdenum (0.20 to 0.30) Molybdenum (1.50 to 2.00 Nickel).....	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium).....	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium).....	0.45
5100 Chromium Spring Steel.....	base
6100 Chromium Vanadium Bar.....	1.10c.
6100 Chromium Vanadium Spring Steel.....	0.70
Chromium Nickel Vanadium.....	1.40
Carbon Vanadium.....	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars 1/2c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars
F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

STAINLESS STEEL No. 302
(17 to 19% Cr. 7 to 9% Ni. 0.08 to 0.20% C.)
(Base Prices f.o.b. Pittsburgh)

Per Lb.	
Forging billets.....	19.55c.
Bars.....	23c.
Plates.....	26c.
Structural shapes.....	23c.
Sheets.....	33c.
Hot-rolled strip.....	20 1/2c.
Cold-rolled strip.....	27c.
Drawn wire.....	23c.

Raw and Semi-Finished Steel

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

Per Gross Ton

Rerolling.....\$29.00

Forging quality.....35.00

Delivered Detroit

Rerolling.....\$32.00

Forging.....38.00

Billets Only F.o.b. Duluth

Rerolling.....\$31.00

Forging.....37.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open-hearth or Bessemer.....\$30.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved.....1.80c.

Universal.....1.80c.

Sheared.....1.80c.

Wire Rods (Common, base)

Per Gross Ton

F.o.b. Pittsburgh.....\$40.00

F.o.b. Cleveland.....40.00

F.o.b. Chicago.....41.00

F.o.b. Anderson, Ind.....41.00

F.o.b. Youngstown.....41.00

F.o.b. Worcester, Mass.....42.00

F.o.b. Birmingham.....43.00

F.o.b. San Francisco.....49.00

F.o.b. Galveston.....46.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.....	\$20.50	\$21.00	\$20.00	\$21.50
Bethlehem, Pa.....	20.50	21.00	20.00	21.50
Birdsboro, Pa.....	20.50	21.00	20.00	21.50
Swedeland, Pa.....	20.50	21.00	20.00	21.50
Steelton, Pa.....	20.50	21.00	20.00	21.50
Sparrows Point, Md.....	20.50	21.00	20.00	21.50
Neville Island, Pa.....	19.50	19.50	19.00	20.00
Sharpsville, Pa.....	19.50	19.50	19.00	20.00
Youngstown.....	19.50	19.50	19.00	20.00
Buffalo.....	19.50	20.00	18.50	20.50
Erie, Pa.....	19.50	20.00	19.00	20.50
Cleveland.....	19.50	19.50	19.00	20.00
Toledo, Ohio.....	19.50	19.50	19.00	20.00
Jackson, Ohio.....	21.25	21.25	20.75	21.75
Detroit.....	19.50	19.50	19.00	20.00
Hamilton, Ohio.....	19.50	19.50	19.00	20.00
Chicago.....	19.50	19.50	19.00	20.00
Granite City, Ill.....	19.50	19.50	19.00	20.00
Duluth, Minn.....	20.00	20.00	19.50	20.50
Birmingham.....	15.50	15.50	14.50	20.00
Provo, Utah.....	17.50	17.50	17.00	17.50

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.....	\$21.00	\$21.50	\$20.50	\$22.00
Brooklyn				
From Eastern Pa.....	22.9289	23.4289	22.4289	23.9289
Newark or Jersey City, N. J.				
From Eastern Pa.....	21.9873	22.4873	21.4873	22.9873
Philadelphia				
From Eastern Pa.....	21.3132	21.8132	20.8132	22.3132
Cincinnati				
From Hamilton, Ohio.....	20.5807	20.5807	20.0807	21.0807
Canton, Ohio				
From Cleveland and Youngstown.....	20.8482	20.8482	20.3482	21.3482
Columbus, Ohio				
From Hamilton, Ohio.....	21.64	21.64	21.14	22.14
Mansfield, Ohio				
From Cleveland and Toledo.....	21.3832	21.3832	20.8832	21.8832
Indianapolis				
From Hamilton, Ohio.....	21.9289	21.9289	21.4289	22.4289
South Bend, Ind.				
From Chicago.....	21.6935	21.6935	21.1935	22.1935
Milwaukee				
From Chicago.....	20.57	20.57	20.07	21.07
St. Paul				
From Duluth.....	21.94	21.94	21.44	22.44
Davenport, Iowa				
From Chicago.....	21.3832	21.3832	20.8832	21.8832
Kansas City				
From Granite City.....	22.2178	22.2178	21.7178	22.7178
San Francisco, Los Angeles or Seattle. From Provo.....	22.315	22.315	21.815	22.815

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.....\$24.00

GRAY FORCE PIG IRON

Valley furnace.....\$19.00
Pittsburgh district furnace.....19.00

CHARCOAL PIG IRON

Lake Superior furnace.....\$22.00

Delivered Chicago.....25.2528

Delivered Buffalo.....25.595

CANADA

Pig Iron

Per gross ton:	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.....	\$21.00
No. 2 fdy., sil. 1.75 to 2.75.....	20.50
Malleable.....	22.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75.....	\$22.50
No. 2 fdy., sil. 1.75 to 2.25.....	22.00
Malleable.....	22.50
Basic.....	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans

Per Gross Ton

Domestic, 80% (carload).....\$75.00

Spiegelisen

Per Gross Ton Furnace

Domestic, 19 to 21%.....\$28.00

50-ton lots 3-mo. shipment.....24.00

F.o.b. New Orleans.....26.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads).....\$77.50

50% (ton lots).....85.00

75% (carloads).....126.00

75% (ton lots).....136.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton

6.00 to 6.50%.....\$22.75

6.51 to 7.00%.....23.25

7.01 to 7.50%.....23.75

7.51 to 8.00%.....24.25

8.01 to 8.50%.....24.75

8.51 to 9.00%.....25.25

9.01 to 9.50%.....25.75

9.51 to 10.00%.....26.25

10.01 to 10.50%.....26.75

10.51 to 11.00%.....27.25

11.01 to 11.50%.....27.75

11.51 to 12.00%.....28.25

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton

10.00 to 10.50%.....\$27.75

10.51 to 11.00%.....28.25

11.01 to 11.50%.....28.75

11.51 to 12.00%.....29.25

12%.....30.25

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads.....\$1.30

Ferrotungsten, lots of 5000 lb.....1.35

Ferrotungsten, smaller lots.....1.40

Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in car loads, and contract.....10.00c.

Ferrocromium, 2% carbon.....16.50c. to 17.00c.

Ferrocromium, 1% carbon.....17.50c. to 18.00c.

Ferrocromium, 0.10% carbon.....19.50c. to 20.00c.

Ferrocromium, 0.06% carbon.....20.00c. to 20.50c.

Ferrovandium, del. per lb. contained V.....\$2.70 to \$2.90

Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.....\$2.50

Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton.....\$137.50

Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton.....142.50

Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18% with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton.....58.50

Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized with Nashville, Tenn.....75.00

Ferromolybdenum, per lb. Mo. del. 95c.

Calcium molybdate, per lb. Mo. del. 80c.

Silico spiegel, per ton, f.o.b. furnace, carloads.....\$38.00

Ton lots or less, per ton.....45.50

Silico-manganese, gross ton, delivered.....

2.50% carbon grade.....85.00

2% carbon grade.....90.00

1% carbon grade.....100.00

Spot prices.....\$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$15.50 to \$16.00
No. 2 heavy melting steel	14.00 to 14.50
No. 2 railroad wrought	15.50 to 16.00
Scrap rails	15.75 to 16.25
Rails, 3 ft. and under	16.50 to 17.00
Compressed sheet steel	15.50 to 16.00
Hand bundled sheet steel	14.00 to 14.50
Hot steel axle turnings	13.50 to 14.00
Machine shop turnings	10.50 to 11.00
Short shov. turnings	10.50 to 11.00
Short mixed borings and turnings	8.25 to 9.25
Cast iron borings	10.50 to 11.00
Cast iron car wheels	12.50 to 13.00
Heavy breakable cast	12.50 to 13.00
No. 1 cast	14.00 to 14.50
Railr. knuckles and couplers	17.25 to 17.75
Rail. coil and leaf springs	17.25 to 17.75
Bolled steel wheels	17.25 to 17.75
Low phos. sheet bar crops	18.00 to 18.50
Low phos. punchings	17.00 to 17.50
Low phos. plate scrap	16.25 to 16.75
Steel car axles	16.00 to 16.50

CHICAGO

Delivered Chicago district consumers:	
Per Gross Ton	
Heavy melting steel	\$14.50 to \$15.00
Automobile hvy. melt steel	12.50 to 13.00
Shoveling steel	14.50 to 15.00
Hydraulic comp. sheets	14.00 to 14.50
Drop forge flashings	12.00 to 12.50
No. 1 busheling	13.50 to 14.00
Rolled car wheels	16.00 to 16.50
Railroad tires	16.00 to 16.50
Railroad leaf springs	16.00 to 16.50
Steel turnings	13.00 to 13.50
Steel couplers and knuckles	16.50 to 17.00
Coil springs	16.50 to 17.00
Steel turnings (elec. fur.)	14.25 to 14.75
Low phos. punchings	17.00 to 17.50
Low phos. plates, 12 in. and under	17.00 to 17.50
Cast iron borings	7.50 to 8.00
Short shoveling turnings	8.75 to 9.25
Machine shop turnings	7.50 to 8.00
Rolling rails	15.50 to 16.00
Steel rails less than 3 ft.	17.25 to 17.75
Steel rails less than 2 ft.	17.50 to 18.00
Angle bars, steel	16.00 to 16.50
Cast iron car wheels	14.00 to 14.50
Railroad malleable	18.00 to 18.50
Agricultural malleable	14.50 to 15.00

Per Net Ton	
Iron car axles	\$18.50 to \$19.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	12.75 to 13.25
No. 2 busheling, old	7.50 to 8.00
Locomotive tires, smooth	13.00 to 13.50
Pipes and flues	8.00 to 8.50
No. 1 machinery cast	13.50 to 14.00
Clean automobile cast	12.50 to 13.00
No. 1 railroad cast	12.50 to 13.00
No. 1 agricultural cast	10.75 to 11.25
Stove plate	8.00 to 8.50
Grate bars	9.50 to 10.00
Brake shoes	9.75 to 10.25

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$13.50 to \$14.00
No. 2 heavy melting steel	12.00 to 12.50
Hydraulic compressed, new	12.00 to 12.50
Hydraulic compressed, old	9.50 to 10.00
Steel rails for rolling	14.50 to 15.00
Cast iron car wheels	14.50 to 15.00
Heavy breakable cast	13.50 to 14.00
No. 1 cast	14.00 to 14.50
Stove plate (steel works)	11.00 to 11.50
Railroad malleable	16.50 to 17.00
Machine shop turnings	8.00 to 8.50
No. 1 blast furnace	6.25 to 6.75
Cast borings	6.00 to 6.50
Heavy axle turnings	10.25 to 10.75
No. 1 low phos. heavy	17.00 to 17.50
Couplers and knuckles	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
Steel axles	16.50 to 17.00
Shafting	18.25 to 18.75
No. 1 railroad wrought	13.00 to 13.50
Spec. iron and steel pipe	10.50 to 11.00
Bundled sheets	11.00 to 11.50
No. 1 forge fire	12.00 to 12.50
Cast borings (chem.)	10.50 to 11.00

CINCINNATI

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$11.50 to \$12.00
No. 2 heavy melting steel	9.50 to 10.00
Scrap rails for melting	11.00 to 11.50
Loose sheet clippings	7.50 to 8.00
Bundled sheets	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Machine shop turnings	7.25 to 7.75
No. 1 busheling	9.00 to 9.50
No. 2 busheling	4.75 to 5.25
Rails for rolling	11.50 to 12.00
No. 1 locomotive tires	10.00 to 10.50
Short rails	14.50 to 15.00
Cast iron car wheels	11.00 to 11.50
No. 1 machinery cast	12.00 to 12.50
No. 1 railroad cast	11.25 to 11.75
Burnt cast	8.25 to 8.75
Stove plate	8.25 to 8.75
Agricultural malleable	10.25 to 10.75
Railroad malleable	12.00 to 12.50

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$14.75 to \$15.25
No. 2 heavy melting steel	13.75 to 14.25
Compressed sheet steel	14.50 to 15.00
Light bundled sheet stampings	11.50 to 12.00
Drop forge flashings	13.50 to 14.00
Machine shop turnings	8.50 to 9.00
Short shoveling turnings	9.00 to 9.50
No. 1 busheling	14.00 to 14.50
Steel axle turnings	13.00 to 13.50
Low phos. billet crops	17.50 to 18.00
Cast iron borings	9.00 to 9.50
Mixed borings and short turnings	9.00 to 9.50
No. 2 busheling	9.00 to 9.50
No. 1 cast	15.00 to 15.50
Railroad grate bars	8.00 to 8.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	17.50 to 18.00
Rails for rolling	17.00 to 17.50
Railroad malleable	17.75 to 18.50
Cast iron car wheels	15.00 to 15.50

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:	
No. 1 heavy melting steel	\$13.00 to \$13.50
No. 2 heavy melting scrap	12.00 to 12.50
Scrap rails	13.00 to 13.50
New hydraul. comp. sheets	12.00 to 12.50
Old hydraul. comp. sheets	10.00 to 10.50
Drop forge flashings	12.00 to 12.50
No. 1 busheling	12.00 to 12.50
Hvy. steel axle turnings	11.25 to 11.75
Machine shop turnings	8.00 to 8.50
Knuckles and couplers	15.50 to 16.00
Coil and leaf springs	15.50 to 16.00
Rolled steel wheels	15.50 to 16.00
Low phos. billet crops	16.00 to 16.50
Short shov. steel turnings	8.25 to 8.75
Short mixed borings and turnings	8.25 to 8.75
Cast iron borings	8.25 to 8.75
No. 2 busheling	7.00 to 7.50
Steel car axles	12.50 to 13.00
Iron axles	12.50 to 13.00
No. 1 machinery cast	12.50 to 13.00
No. 1 cupola cast	11.50 to 12.00
Stove plate	10.00 to 10.50
Steel rails, 3 ft. and under	14.50 to 15.00
Cast iron car wheels	12.00 to 12.50
Railroad malleable	16.25 to 16.75
Chemical borings	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:	
*No. 1 heavy melting steel	\$10.75 to \$11.00
*No. 1 heavy melting steel	9.40 to 9.90
*Scrap rails	10.75 to 11.00
*Scrap rails	9.40 to 9.90
*No. 2 steel	9.75 to 10.00
*No. 2 steel	8.75 to 9.00
*Breakable cast	8.25 to 8.50
*Machine shop turnings	5.75 to 6.00
*Machine shop turnings	4.40 to 4.70
Bundled skeleton, long	8.00 to 8.50
Shafting	13.75 to 14.00
Engine blocks, stripped	8.00 to 8.50
Cast iron borings, chemical	5.00 to 5.50
Cotton ties	6.00 to 6.50
*Stove plate	7.00 to 7.50

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$9.25 to \$9.50*
No. 2 heavy melting steel	8.25 to 8.50*
Heavy breakable cast	9.00 to 9.50
No. 1 machinery cast	9.50 to 10.00
No. 2 cast	7.75 to 8.25
Stove plate	7.00 to 7.50
Steel car axles	13.50 to 14.00
Shafting	13.50 to 13.75
No. 1 railroad wrought	9.50 to 10.00
No. 1 yard wrought long	8.50 to 9.00
Spec. iron and steel pipe	7.50 to 8.00
Forge fire	7.50 to 8.00
Rails for rolling	11.00 to 12.00
Short shoveling turnings	5.00 to 5.50
Machine shop turnings	4.50 to 5.00
Cast borings	4.50 to 5.00
No. 1 blast furnace	3.00 to 3.50
Cast borings (chemical)	10.00 to 11.00
Unprepared yard iron and steel	5.50 to 6.00

Per gross ton, delivered local foundries:	
No. 1 machinery cast	\$11.50
No. 1 hvy. cast (cupola size)	9.50
No. 2 cast	8.00

* Loading on barge.
*50c. to \$1.00 higher offered at nearby New Jersey points for rail shipments.

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$11.00 to \$11.50
Scrap steel rails	11.50 to 12.00
Short shoveling turnings	7.00 to 7.50
Stove plates	8.00 to 8.50
Steel axles	12.00 to 12.50
Iron axles	12.00 to 12.50
No. 1 railroad wrought	8.50 to 9.00
Rails for rolling	12.50 to 13.00
No. 1 cast	12.00 to 12.50
Tramcar wheels	11.00 to 12.00

ST. LOUIS

Dealers' buying prices per gross ton delivered consumers' works:	
Selected heavy steel	\$12.50 to \$13.00
No. 1 heavy melting	12.50 to 13.00
No. 2 heavy melting	11.00 to 11.50
No. 1 locomotive tires	11.00 to 11.50
Misc. stand-sec. rails	13.00 to 13.50
Railroad springs	12.00 to 12.50
Bundled sheets	9.50 to 10.00
No. 2 railroad wrought	12.50 to 13.00
No. 1 busheling	7.50 to 8.00
Cast iron borings and shoveling turnings	4.50 to 5.00
Rails for rolling	13.75 to 14.25
Machine shop turnings	4.00 to 4.50
Heavy turnings	9.25 to 9.75
Steel car axles	13.00 to 13.50
Iron car axles	15.00 to 16.00
No. 1 railroad wrought	10.50 to 11.00
Steel rails less than 3 ft.	13.50 to 14.00
Steel angle bars	13.00 to 13.50
Cast iron car wheels	11.00 to 11.50
No. 1 machinery cast	11.25 to 11.75
Railroad malleable	14.25 to 14.75
No. 1 railroad cast	11.25 to 11.75
Stove plate	7.50 to 8.00
Agricult. malleable	12.50 to 13.00

DETROIT

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$12.00 to \$12.50

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports	
Per Gross Ton	
Old range, Bessemer, 51.50% iron	\$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.I.F. Philadelphia or Baltimore	
Per Unit	
Iron, low phos., copper free, 55 to 58% iron dry Spanish or Algeria	10.25c.
Iron, low phos., Swedish, average 68% iron	10.25c.
Iron, basic or foundry, Swedish, aver. 65% iron	9.50c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian 48%	25c.
Manganese, African, Indian, 49-51%	26c.
Manganese, Brazilian, 46 to 48%	24c.

Per Net Ton Unit	
Tungsten, Chinese, wolframite, duty paid, delivered, nominal	\$16.00
Tungsten, domestic, scheelite delivered, nominal	16.00

Per Gross Ton	
Chrome, 45% Cr ₂ O ₃ , lamp, c.i.f. Atlantic Seaboard (African)	\$17.50
45 to 46% Cr ₂ O ₃ (Turkish)	\$16.50 to \$17.00
48% Cr ₂ O ₃ (African)	20.50
48% min. Cr ₂ O ₃ (Turkish)	19.25
Chrome concentrate, 50% and over Cr ₂ O ₃ , c.i.f. Atlantic Seaboard	22.00
52% Cr ₂ O ₃ (Turkish)	21.75
48 to 49% Cr ₂ O ₃ (Turkish)	19.25

Fluorspar

Per Net Ton	
Domestic, washed gravel, .85-5. f.o.b. Kentucky and Illinois mines for all rail shipment	\$18.00
No. 2 lump, .85-5. f.o.b. Kentucky and Illinois mines	18.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	20.00
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke	
Per Net Ton	
Furnace, f.o.b. Connellsville	\$3.65 to \$3.80
Prompt	4.25 to 5.75
Foundry, f.o.b. Connellsville	4.25 to 5.75
Prompt	4.25 to 5.75
Foundry, by-product, Chicago ovens for delivery outside switching district	9.00
Foundry, by-product, delivery in Chicago switching district	9.75
Foundry, by-product, New England, delivered	11.50
Foundry, by-product, Newark or Jersey City, del'd	9.65
Foundry, by-product, Phila. England, delivered	9.38
Foundry, by-product, Cleveland, delivered	9.75
Foundry, by-product, Cincinnati, del'd	9.50

No. 2 heavy melting steel	\$10.75 to \$11.25
Borings and turnings	7.50
Long turnings	8.50 to 9.00
No. 1 machinery cast	14.50 to 15.00
Automotive cast	14.50 to 15.00
Hydraulic comp. sheets	12.50 to 13.00
Stove plate	8.75 to 9.25
New factory busheling	11.00 to 11.50
Old No. 2 busheling	6.50 to 7.00
Sheet clippings	9.00 to 9.50
Flashings	11.25 to 11.75
Low phos. plate scrap	12.50 to 13.00

CANADA

Dealers' buying prices per gross ton:	
Toronto Montreal	
Heavy melting steel	\$7.50 \$7.00
Rails, scrap	8.50 8.00
Machine shop turnings	4.00 4.00
Roller plate	7.00 6.00
Heavy axle turnings	4.50 4.00
Cast borings	4.00 4.50
Steel borings	4.00 4.00
Wrought pipe	4.00 4.00
Steel axles	8.50 9.00
Axles, wrought iron	9.00 9.50
No. 1 machinery cast	11.50 11.00
Stove plate	7.50 7.00
Standard car wheels	7.00 7.00
Malleable	11.00 10.50
Shoveling steel	6.50 6.00
Bushellings	6.00 5.50
Compressed sheets	6.50 6.00

Foundry, Birmingham	\$6.50
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal

Per Net Ton	
Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.90 to 2.10
Gas coal, 1/4-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.0

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.95c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	3.35c.
Squares and flats	3.35c.
Hoops and bands under 1/4 in.	3.20c.
Hot-rolled annealed sheets (No. 24)	3.30c.
25 or more bundles	3.35c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count	65 per cent off list.
Machine bolts, 100 count	65 per cent off list.
Carriage bolts, 100 count	65 per cent off list.
Nuts, all styles, 100 count	65 per cent off list.
Large rivets, base per 100 lb.	\$3.50
Wire, black, soft ann'l'd, base per 100 lb.	2.65c.
Wire, galv. soft, base per 100 lb.	3.00c.
Common wire nails, per keg	2.60c.
Cement coated nails, per keg	2.60c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lbs.
*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars, rounds	3.00c.
Soft steel bars, squares and hexagons	3.15c.
Cold-finished steel bars:	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	5.65c.
Rivets, boiler (keg lots)	5.75c.
Machine bolts	70
Carriage bolts	70
Lag screws	70
Hot-pressed nuts, sq. tap or	70
Hot-pressed nuts, hex. tap or	70
Hot-pressed nuts, hex. tap or blank	70
Hex. head cap screws	87 1/2
Cut point set screws	75 and 10
Flat head bright wood screws	70
Spring cotter pins	55
Store bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57 1/2
Wrought washers	\$4.50 off list
Black ann'l'd wire per 100 lb.	\$3.85
Com. wire nails, base per keg	2.95
Cement c't'd nails, base per keg	2.95

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts apply to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.
†Prices for city and suburbs only.

NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, rounds	3.31c.
Iron bars	3.31c.
Iron bars, welded, charcoal, 4.75c. to 7.00c.	
Cold-finished, shafting and screw stock:	
Rounds and hexagons	3.81c.
Flats and squares	3.81c.
Cold-rolled; strip, soft and quarter hard	3.36c.
Hoops	3.56c.
Bands	3.56c.
Hot-rolled sheets (No. 10)	3.31c.
Hot-rolled ann'l'd sheets (No. 24)	3.89c.
Galvanized sheets (No. 24)	special
Long term sheets (No. 24)	5.25c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x 1/2 in. and larger	3.75c.
Open heart spring steel, 4.00c. to 10.00c.	
Common wire nails, base, per keg	\$3.21
Machine bolts, square head and nut:	
All diameters	65 and 10
Carriage bolts, thread:	
All diameters	65 and 10

	Per 100 Ft.
Boiler tubes:	
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.45c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.40c.
Cold-finished, rounds, shafting, screw stock	3.75c.
Hot-rolled annealed sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.65c.
Hot-rolled sheets (No. 10)	3.30c.
Black corrug. sheets (No. 24)	4.10c.
Galv. corrug. sheets	4.65c.
Structural rivets	4.00c.
Boiler rivets	4.10c.
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, blow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	
All quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	2.98c.
*Structural shapes	2.98c.
*Soft steel bars, small shapes, iron bars (except bands)	3.03c.
*Reinforc. steel bars, sq. twisted and deformed	2.90c.
Cold-finished steel bars	3.76c.
*Steel hoops	3.43c.
*Steel bands, No. 12 and 3/16 in. incl.	3.18c.
Spring steel	5.00c.
Hot-rolled anneal. sheets (No. 24)	3.65c.
Galvanized sheets (No. 24)	4.40c.
Hot-rolled annealed sheets (No. 10)	3.08c.
Diam. pat. floor plates, 1/4 in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.
†For 25 bundles and over.
‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.10c.
Cold-finished steel bars	3.50c.
Flat-rolled steel under 1/4 in.	3.30c.
Cold-finished strip	3.90c.
Hot-rolled annealed sheets (No. 24)	3.91c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
*Black ann'l'd wire, per 100 lb.	\$2.45
*No. 9 galv. wire, per 100 lb.	2.80
*Com. wire nails, base per keg	2.40

†Outside delivery 10c. less.
*For 5000 lb. or less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.42c.
Bars, rounds, flats and angles	3.22c.
Other shapes	3.37c.
Ball steel reinforce. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.47c.
Cold-finished bars	3.72c.
Hot-rolled annealed sheets (No. 24)	4.02c.
Galv. sheets (No. 24)	4.72c.
Hot-rolled sheets (No. 10)	3.22c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$2.88
Com. wire nails, base per keg:	
Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain, lin. per 100 lb.	3.35
Seamless steel boiler tubes, 2-in.	\$20.37
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.38
4-in.	45.32

BUFFALO

	Base per Lb.
Plates	3.88c.
Struc. shapes	3.25c.
Soft steel bars	3.95c.
Reinforcing bars	2.60c.

Cold-finished flats and sq.	3.55c.
Rounds and hex.	3.55c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.06c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.63c.
Galv. sheets (No. 24)	4.70c.
Bands	3.43c.
Hoops	3.43c.
Heavy hot-rolled sheets	3.18c.
Com. wire nails, base per keg	\$3.15
Black wire, base per 100 lb. (2500 lb. lots or under)	3.50
(Over 2500 lb.)	3.10

BOSTON

	Base per Lb.
Beams, channels, angles, tees, zees	3.54c.
H beams and shapes	3.54c.
Plates—Sheared, tank and univ. mill.	3.56c.
1/4 in. thick and heavier	3.56c.
Floor plates, diamond pattern	5.36c.
Bar and bar shapes (mild steel)	3.45c.
Bands 3/16 in. thick and	
No. 12 ga. incl.	3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels	4.70c.
Tire steel	4.70c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.90c.
Blue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24 ga.	4.20c.
Galvanized steel sheets, No. 24 ga.	4.90c.
Lead coated sheets, No. 24 ga.	5.85c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.09c.
Structural shapes	3.42c.
Plates	3.42c.
Floor plates	5.17c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Hot-rolled sheets (No. 10)	3.14c.
Galvanized sheets (No. 24)**	4.72c.
Hoops	3.39c.
Hot-finished bars	3.64c.
Cold-rolled strip	3.18c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.29c.*
Bolts and nuts, in cases	70 and 10 per cent off list
Broken cases	70 per cent off

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.
*Price applies to 1,000 lb. and over.
†With reduction in chemical extras.
**0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.31c.
Soft steel bars, rounds up to 8 in.	3.11c.
Soft steel bars, squares and hexagons	3.26c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 20)	4.66c.
Cold-finished steel bars	3.61c.
Cold-rolled strip	3.33c.
Structural rivets (keg lots)	3.86c.
Boiler rivets, cone head (keg lots)	3.96c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.86c.
Black annealed wire	3.15c.
Com. wire nails	2.85c.
Cement coated nails	2.85c.
Machine bolts	70 and 10
Carriage bolts	70 and 10
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	70 and 10

Prices given above are delivered Milwaukee.
On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	3.25c.
Structural shapes	3.45c.
Plates	3.45c.
Cold-finished bars	4.02c.
Bands and hoops	3.55c.
Hot-rolled annealed sheets, No. 24	3.90c.
Galvanized sheets, No. 24	4.50c.
Cold-rolled sheets, No. 20	4.95c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

	Base per Lb.
Mild steel bars	3.00c.

**Reinforcing bars	2.85c.
*Structural shapes	3.00c.
†Plates	3.00c.
‡Hot-rolled sheets, No. 10	3.10c.
§Hot-rolled annealed sheets, No. 24	3.60c.
¶Galvanized sheets, No. 24	4.30c.
*Bands	3.20c.
*Hoops	3.45c.
§Cold-rolled rounds	3.58c.
§Cold-rolled squares, hex. and flats	3.58c.
Rivets	4.40c.
Bolts and nuts, per cent off list	.60 and 10

*Quantity extras per size apply. †Quantity extras per thickness apply. Hot-rolled quantity extras are: 2000 lb. and over, base; 1500 lb. to 1999 lb., add 15c. per 100 lb.; 1000 lb. to 1499 lb., add 30c.; 0 to 999 lb., add 50c.

‡25 bundles and over, base. For 1 to 9 bundles add 50c. per 100 lb.; for 10 to 24 bundles add 25c.
§Base for 1000 lb. and over. For 500 to 999 lb., add 25c. per 100 lb.; for 500 to 499 lb., add \$1.00; for 0 to 299 lb., add \$1.75; for combined order under 100 lb., add \$3.00.

**For orders 4000 lb. to 9999 lb., add 15c. per 100 lb. for orders 2000 to 3999 lb.; add 65c. for orders less than 2000 lb.

CHATTANOOGA

	Base per Lb.
Mild steel bars	3.36c.
Iron bars	3.36c.
Reinforcing bars	3.36c.
Structural shapes	3.56c.
Plates	3.56c.
Hot-rolled sheets, No. 10	3.36c.
Hot-rolled annealed sheets, No. 24	4.16c.
Galvanized sheets, No. 24	4.86c.
Steel bands	3.61c.
Cold-finished bars	3.98c.

MEMPHIS

	Base per Lb.
Mild steel bars	3.47c.
Shapes, bar size	3.47c.
Iron bars	3.47c.
Structural shapes	3.67c.
Plates	3.67c.
Hot-rolled sheets, No. 10	3.47c.
Hot-rolled annealed sheets, No. 24	4.27c.
Galvanized sheets, No. 24	4.80c.
Steel bands	3.72c.
Cold-drawn rounds	3.89c.
Cold-drawn flats, squares, hexagons	5.89c.
Structural rivets	4.55c.
Bolts and nuts, per cent off list	65
Small rivets, per cent off list	50

NEW ORLEANS

	Base per Lb.
Mild steel bars	3.35c.
Reinforcing bars	3.50c.
Structural shapes	3.55c.
Plates	3.55c.
Hot-rolled sheets, No. 10	3.55c.
Hot-rolled annealed sheets, No. 24	4.50c.
Galvanized sheets, No. 24	4.95c.
Steel bands	3.95c.
Cold-finished steel bars	4.30c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	\$2.95
Bolts and nuts, per cent off list	70

PACIFIC COAST

	Base per Lb.
San Fran.	
Los An.	
San Francisco Seattle	
Plates, tank and	3.25c. 3.60c. 3.55c.
U. M.	3.25c. 3.60c. 3.55c.
Shapes, standard	3.25c. 3.60c. 3.55c.
Soft steel bars	3.25c. 3.60c. 3.70c.
Reinforcing bars	
f.o.b. cars dock	2.45c. 2.45c. 2.45c.
Pacific ports	2.45c. 2.45c. 2.45c.
Hot-rolled annealed sheets (No. 24)	4.00c. 4.35c. 4.40c.
Hot-rolled sheets (No. 10)	3.35c. 3.70c. 3.75c.
Galv. sheets (No. 24)	4.50c. 4.95c. 5.00c.
Cold finished steel	
Rounds	5.80c. 5.85c. 6.00c.
Squares and hexagons	7.05c. 7.10c. 7.25c.
Flats	7.55c. 7.60c. 8.25c.
Common wire nails	
—base per keg	
less carload	\$3.20. \$3.20. \$3.20

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

	Base per Lb.
High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	14c.

Steel Production Off Slightly at Cleveland



Miscellaneous Demand Has Improved, Although Automotive Buying Is Not Yet in Large Volume—
Prices Unsettled

CLEVELAND, March 3. — Miscellaneous seasonal demand for finished steel is broadening and is partially filling the gap caused by the lack of volume business in the automotive field. Ingot output in the Cleveland Lorain district declined two points to 64 per cent of capacity this week, one open-hearth furnace having been taken off at Lorain.

New demand for sheets and strip steel from motor car manufacturers as yet does not show much, if any, gain, but considerable steel is still being shipped in releases against old orders. Demand for bars from the motor car industry shows a slight gain. While business from railroads is slack at present, inquiries from the Van Sweringen roads are expected shortly for a substantial tonnage of rails.

Dock improvements for the Republic Steel Corp. in Cleveland will require 1200 tons of steel piling, of which 600 tons will be new piling. The Republic company will also require a wire mill building for its South Chicago works.

Second quarter prices have not yet been named, but price announcements are expected during the week. Bolt and nut and rivet manufacturers, not waiting for the naming of prices on their raw materials, have reaffirmed present quotations for the coming quarter.

The \$3 a ton concessions on sheet and strip steel are still in effect, and this reduction is now being applied to enameling sheets which for some time resisted the downward price trend. Unable to make sheets and strip at a profit at ruling prices, leading producers seem determined to get the market back to the present established quotations for the coming quarter. Steel bars are very firm and the reaffirmation of present prices is expected. Scrap prices have again moved upward from 25c. to 50c. a ton and fluorspar has advanced another 50c. a ton.

Pig Iron

Sales of several thousand tons are expected this week following the opening of books March 2 at reestablished prices. This business will come from foundries that commonly make quarterly contracts. Current orders are moderate. Sales during the week included a 500-ton and a 1000-ton lot for March shipment, the latter to an implement manufacturer. Sales and shipments in February were practically the same as in January. Slackening in the demand from automotive foundries was offset by improvement in orders from manufacturers of heating equipment, from makers of railroad equipment, from agricultural implement manufacturers and from jobbing foundries. A price advance during the quarter is talked of.

Sheets

While some small lot business is coming from the motor car industry, the expected improvement in the demand from this source has not yet materialized. Miscellaneous business is fair. Some consumers are taking advantage of the present \$3 a ton price concession by purchasing larger lots than they would otherwise buy. Refrigerator manufacturers are taking good shipments against recent purchases. Demand from stove makers continues good. A \$3 a ton concession that recently appeared on enameling sheets has become quite general. Galvanized sheets are very irregular with reports of concessions of more than \$3 a ton.

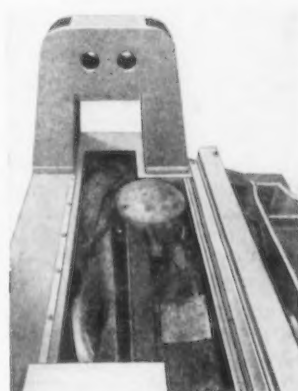
Strip Steel

Automobile parts manufacturers continue to take shipments against old orders but are making no new commitments. However, some evidently would place orders for April delivery could they do so at the \$3 a ton price concession now prevailing. Miscellaneous demand is quiet.

Rails

The Chesapeake and Ohio Railroad is expected to come into the market shortly for approximately 20,000 tons of rails. The inquiry of the Erie Railroad for 19,000 tons has not yet appeared. The present price of \$36.37½ for standard rails has been extended for sec-

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and quarter sales and deliveries through the third quarter. The Nickel Plate railroad has ordered 6800 tons of rails, 4500 tons from the Carnegie-Illinois Steel Corp., 1500 from the Inland Steel Co. and 800 from the Bethlehem Steel Corp.

Bolts, Nuts and Rivets

Present prices on bolts, nuts and rivets have been reaffirmed for the second quarter. These are 70, 10 and 5 per cent discount on small machine and carriage bolts and 70 and 10 per cent on large machine and carriage bolts and on hot pressed and semi-finished nuts, \$2.90 per 100 lb. Cleveland and \$3 Chicago on large rivets and 70 and 5 per cent discount on small rivets. Present prices on cap and set screws also have been reaffirmed for the coming quarter. Bolt and nut manufacturers seem determined to avoid deviation from regular prices during the coming quarter. With the outlook for a steady demand from the automotive industry, railroads, agricultural implements manufacturers and other consumers, they expect a very satisfactory spring business.

Bars, Plates and Shapes

Miscellaneous demand for bars show quite an improvement. Orders are coming more freely from manufacturers of agricultural implements, small farm tools and road machinery. Business from forge shops for automobile parts shows some further gain, but is still much below normal. Reinforcing bars are quiet. Mills are getting a good tonnage in structural steel for work placed in recent weeks. In the construction field, public work, largely suspended during the winter months, is starting to come out. The Ohio Highway Department will take bids March 17 on several projects requiring 2500 tons of structural shapes. Another building for the Great Lakes Exposition at Cleveland, requiring 250 tons, is out for figures, making a total of 800 tons pending for that project.

Fluorspar

A 50c. a ton advance on gravel fluorspar to \$18 for all rail shipment was announced March 2. For barge shipment a \$19 price was named.

Scrap

Steel making scrap has again advanced 25c. to 50c. a ton and blast furnace grades that remained stationary for a few weeks have also had similar advances. Brokers are paying \$15 and higher for No. 1 heavy melting steel to cover against orders placed recently by a Cleveland mill and \$15.50 to \$16

against a \$16 Youngstown order. A Cleveland consumer is inquiring for blast furnace scrap and some new purchases of steel making scrap are expected this week. Railroad malleable scrap has advanced sharply. Milder weather so far has made the supply of scrap only slightly more plentiful. Several Michigan automobile companies have closed on their March scrap lists which are much larger than those of February. Prices paid reflected the present market conditions. New York Central will close May 5 on a small list.

Steel Production Up In Ohio River Area

CINCINNATI, Ohio, March 3.—First glimmerings of consumer fear that prices on finished sheets will increase during the second quarter were reflected in this area during the past week, when a number of users placed orders in apparent excess of current needs, for delivery by March 31. In addition to these early purchases, demand from the automotive field tended upward, bringing total business to approximately 90 per cent of capacity output. General miscellaneous demand also showed a moderate improvement with a corresponding upward swing in temperatures.

Mill interests indicate that no price attractions are being offered. The general trend is toward an increase which will likely materialize before books are opened for second quarter business. All units of the leading interests are reported to be in operation and average production has approached 90 per cent of mill capacity.

Steel making rose actively five points last week to an approximate average of 78 per cent. One interest, reported to have taken off two open-hearths last week, has refired one, leaving 30 out of 39 open-hearths in operation in this district.

The district scrap market is unabated in dealer optimism despite mill reluctance to buy for more than immediate needs. Reports of improved old materials movement in the Valleys have tended to improve local market strength, but dealers show no disposition to forward material into that area. Current business consists largely of small sales of specialty materials and foundry scrap at good prices. These, however, while of small value to indicate the market strength on possible heavy sales, are not in sufficient quantity to supply an accurate test of the market.

Dealers continue to be bullish and constant adherence to higher

prices has caused the market undertone to be steadily stronger. Improved weather conditions may also aid the market in that barge shipments will be released and yard work, halted by sub-zero weather, will again get under way.

With foundry operations better, specifications of foundry coke against contracts tend upward. Prices on by-product foundry coke have been reaffirmed at \$9.50, delivered in Cincinnati.

Steel jobbers in this area closed February books revealing warehouse sales for the month to have been on a parity with January and encouragingly higher than the corresponding month of 1935. A number of small inquiries on building materials increase optimism toward better demand from this source in the next month.

With shipments against pig iron contracts rapidly catching up with contracts, the outlook in that market is improved. Books will be opened for the second quarter, shortly, at the current prices of \$19.50 base, Hamilton, for No. 2 foundry iron with Southern furnaces retaining the customary 38c. differential. Current business is confined to small lots ranging from single carloads up to 100 tons and showing no relative change from the market average of about 1200 tons a week. A few early inquiries on small lots, ranging up to 500 tons, stimulate hopes of furnace interests that second quarter ordering will be brisk.

Buffalo Operations Are Much Higher

BUFFALO, March 3.—Bethlehem's Lackawanna plant has put on three open-hearth furnaces since last reported and Republic Steel Corp. has added one. Twelve furnaces are now active at Lackawanna and three at Republic. Wickwire-Spencer Corp. continues to run one and the Seneca sheet division of Bethlehem is at 75 per cent.

Pig iron business is reported satisfactory. Shipments are holding up and books for second quarter are now open. The outlook for spring business is good. Bookings run from carload lots to 500 tons. Three blast furnaces are active at Lackawanna, two at Hanna Furnace Corp., one at Republic and one at Tonawanda Iron Corp.

A new order for No. 2 heavy melting steel is out at \$12.50. This business, reported to have been 4000 to 5000 tons, went to two dealers. Scrap is now moving freely to the Youngstown district from Buffalo. With Youngstown offer-

ing \$15.75 for No. 1 heavy melting steel, dealers have no hesitancy in shipping out material. Seldom, they maintain, have the outside markets attained their present strength, while the local market remained low. This is due to the resolute attitude of the largest consumer in refusing to offer what the dealers demand.

Large Scrap Order Is Placed at St. Louis

ST. LOUIS, March 3.—An East Side mill has purchased 10,000 tons of No. 2 heavy melting steel, the largest order for scrap iron that has been placed here in the last four months. The material was bought at the present level from four dealers and is for delivery over the next 60 days. With the edge off the market, other mills which had been contemplating purchases are holding off. While prices are unchanged, the market is not as firm as it has been because of heavy offerings of scrap iron, now that the weather has moderated.

Books for second quarter for pig iron orders were opened today, with the same prices as prevailed during the preceding quarters on both Northern and Southern iron. It is expected that second quarter buying will be fairly heavy, although not so great as for the last quarter of 1935. The melt for the first two months of 1936 is said to be considerably ahead of the same period a year ago. Stocks of pig iron in hands of melters are expected to be pretty well depleted by the end of the present quarter. Stove foundries in Belleville have not yet struck their full stride since the settlement of the strike of enamellers. Agricultural implement interests in the Tri-cities are still going strong.

Cold weather, followed by heavy roads which make it impossible to move heavy goods off the main highways, slowed up considerably the movement of galvanized roofing and wire products for use on farms. The weather also has retarded building operations and in turn held up specifications for structural steel.

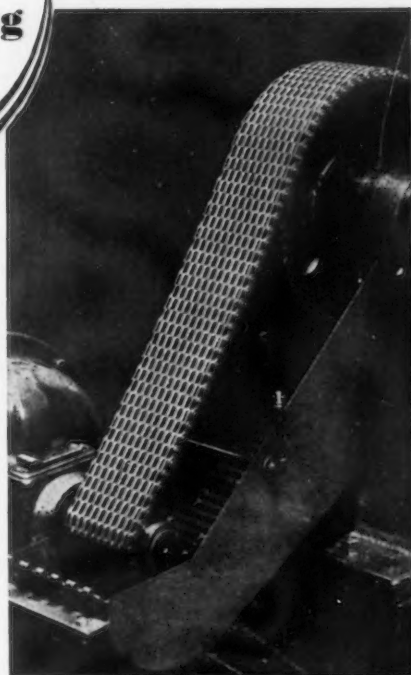
The State of Illinois will open bids today on 10 highway bridge projects requiring 750 tons of structural steel. The general contract for the University City Senior High School auditorium and addition, requiring 200 tons of reinforcing bars, has been awarded to Woerman Construction Co. H. B. Deal & Co. is low bidder on a ward building for Koch Hospital here, requiring 108 tons of reinforcing bars.

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Boston Scrap Prices Still Very Strong

BOSTON, March 3.—The scrap price structure is very strong despite the thawing out of scrap piles. Exporters of 7600 tons of material for Italy have filled requirements and the steamer should sail within a week. A steamer has arrived here to load 1500 to 1800 tons of turnings and other light materials for a European port, and local exporters have contracted for additional vessel space to load within 30 days. A steamer is scheduled for Providence, R. I., March 10 to load a part cargo.

Pittsburgh is beginning to take No. 1 steel, turnings, skeleton, engine blocks and stove plate, but in a restricted way. However, such buying has strengthened prices, especially those for skeleton. Small lots of breakable cast are moving to Pennsylvania and other eastern points at \$8.25 a ton, f.o.b., and shafting at \$13.75. The movement of cast to New England consuming points is a little more active, but involved tonnages are small. The chemical borings market continues disappointing to shippers.

Furnace representatives are soliciting business for next quarter shipment, but results to date have been negligible. Prices on domestic brands are being maintained, but on unimportant lots of certain foreign brands concessions have been named. Deliveries of by-product foundry coke to March 1 by New England makers ran ahead of those for the like 1935 period.

Detroit Scrap Prices Continue Strong

DETROIT, March 3.—The market continues very strong as the effects of the recent resumption of automotive activity have not yet been felt in scrap supplies. The rise in demand for auto steel should run up steel mill operations in keeping with the increased supply, the net result being a continued high level of scrap prices.

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Eastern Pennsylvania Rate Advances One Point



New Price Schedules Expected This Week — Ordering of Flat-Rolled Steel Improves as Consumers Seek Protection — Scrap Holds Steady

PHILADELPHIA, March 3.—Practically every district mill is now selling flat-rolled steel at prices under published quotations. However, these same mills must soon announce second quarter prices, and there is a general feeling that books will be opened at levels very much in line with published quotations. Either the mills will reaffirm first quarter price lists and inform the trade that no concessions will be granted or else there may be a general shifting of extras which will in the end amount to practically the same thing. In any case, most mills have had a bad scare during the past several weeks and have no heart for continued price disorganization.

There has been a noticeable improvement in orders during the past week, and this increase can be attributed to somewhat better business and also a desire on the part of certain consumers to order ahead as protection against any adverse price action which might develop. There is every indication that protective orders will increase during the next two weeks, therefore mill operations should also show an increase in order to take care of the fast deliveries which will be necessary.

Bethlehem is operating at approximately the same level as last week, the Harrisburg mill has added an additional open-hearth, and there has been a slight improvement among other district melters. Consequently the average district operating rate has moved up one point to 41 per cent of capacity. This rate compares with operations of 36 per cent a year ago.

Pig Iron

Sellers have succeeded in placing very little second quarter iron. Most consuming industries are still drawing on old contracts or are liquidating yard stocks, and it may be a few weeks yet before pig iron throws off its protracted lethargy. Despite the general lack of demand

and the constant inroads of certain low-priced foreign brands, all district furnaces are adhering strictly to published quotations. This well-ordered price set-up is particularly remarkable when compared with the current unsettled condition of finished steel prices. The pig iron price basis has, of course, recently received some support from a rapidly rising scrap market. No. 1 cast, a competing material, is now priced around \$14.50, and none too plentiful at this level. With many sellers of iron competing to satisfy the limited needs of this territory, the situation is further complicated by the entrance of a new seller. Base Products Co. (Colonial Stove Co.) is offering a wide range of analyses, believed to be a number of odds and ends, both foreign and domestic. What price concessions are possible cannot at this time be ascertained.

Bars, Plates and Shapes

Merchant bars have shown some improvement during the week, and releases of plate orders from shipyards and railroads are also somewhat better. Shapes and reinforcing bars continue almost inactive in the absence of building and highway releases. The largest fabricating award of the week was for 65 tons, and there is no immediate prospect of worthwhile improvement in either miscellaneous awards or large projects. This picture is not as black as it seems, however, for there is quite a volume of accumulated tonnage which has been held back for political approval or because of poor weather conditions. This tonnage should reach mills toward the latter part of the second quarter, at a time when they will have the most need for additional rolling orders. Plate and shape prices are steady at quoted levels, and fabricating quotations are unchanged and somewhat better than those in effect last June. Additional business totaling about 2800 tons of shapes and 1000 tons of bars came up for bidding during the week. These

jobs include several local schools, and some grade elimination and bridge work in New Jersey and Pennsylvania.

Sheets and Strip

Bookings have increased during the past week, mostly as the result of a general desire on the part of consumers to cover forward needs in a modest way. Second quarter prices are expected to appear late in the week, and most consumers believe that this new set-up will call for delivered prices greater than current unofficial quotations, i.e., 3.26c. for 24-gage galvanized and 3.11c. for light cold-rolled auto stock. These quotations are now in effect only for prompt acceptance. If second quarter schedules are announced this week at levels approaching published quotations, there is bound to be an influx of protective orders for March delivery. The volume of forward coverage will depend entirely on how effectively steel sellers impress steel consumers with their determination to rigidly adhere to the new price set-up. In addition to these protective orders, there is every indication that consumer demands to cover day-to-day requirements will improve during March. Auto-body plants have increased operations, jobbers report a better turnover and general miscellaneous business has an upward trend.

Imports

The following iron and steel imports were received here last week: 1101 tons of pig iron from British India; 443 tons of steel sheets from Germany; 245 tons of pig iron from Norway; 199 tons of sponge iron, 76 tons of C.D.S. wire, 47 tons of steel tubes, 10 tons of steel forgings and 64 tons of steel bars from Sweden.

Scrap

Heavy breakable cast was sold last week at \$14 a ton, delivered district mill, but no new No. 1 or No. 2 sales have been unearthed. Consequently the most important steel-making grade, No. 1 steel, remains quotably at \$13.50 to \$14.00, with the average value of \$13.75, the most representative value for the current market. Weather conditions have improved considerably and the turnover of scrap has naturally enough accelerated as a consequence. Nevertheless, the total volume moving here has not by far reached the proportions of three months ago, and it is estimated that normal deliveries will not rule for at least four weeks. The most conspicuous development of the past week was the sale of the Budd Mfg. Co. March list of compressed

bundles to the Coatesville consumer at a delivered price approximating the quoted price for No. 1 steel. Budd Co. operations are steadily improving, and the March list is expected to exceed 2800 tons. Inasmuch as it has been impossible to accumulate an export cargo of steel, a boat due to dock this week at Port Richmond has been sent to another Atlantic port. New export sales have been made, mostly for delivery near the middle of the year.

Financial Notes

Mesta Machine Co., Pittsburgh, reports 1935 net profit of \$3,114,526 after all charges and taxes, equivalent to \$3.11 a share of common stock. This compares with net earnings of \$1,517,249 in 1934. Uncompleted business carried over into 1936 amounted to \$8,164,877, compared with \$2,347,006 carried into 1935.

Anaconda Copper Mining Co., Anaconda, Mont., has declared dividend of 25c. a share on its common stock, payable April 20 to stock of record March 14. This marks the first disbursement on the stock since 1931.

Anaconda Wire & Cable Co., New York, and subsidiaries, report net income for 1935 at \$1,029,401, or \$2.44 a capital share. This compares with \$821,801, or \$1.95 a share, in 1934.

Dominion Steel & Coal Corp., Ltd., Sidney, Nova Scotia, Canada, has 1935 net profit of \$145,348, as against a loss of \$674,936 in 1934.

General Bronze Co., Pittsburgh, and subsidiaries, had 1935 net profit of \$80,336, or 35c. a common share, compared with 1934 net loss of \$460,239.

National Acme Co., Cleveland, had 1935 net profit of \$257,408, as against \$140,329 in 1934.

National Lead Co., New York, had 1935 net profit, excluding share in earnings of foreign subsidiaries and controlled companies, of \$5,261,390, or \$10.78 a share on average number of common shares outstanding. Addition to profits, through share in earnings of foreign and partly-owned units, would increase this figure by \$1.26 to a total of \$12.04. In 1934, profit was \$4,200,188, or \$8.37 a share. Directors of the company have recommended to stockholders a 10-for-1 split in the common stock, which will be voted on at a meeting on April 16. Plan would increase the authorized common to 5,000,000 from 500,000, and reduce par value to \$10 from \$100. It is felt that the plan will permit a wider distribution of the corporation's stock and enhance its marketability.

Molybdenum Corp. of America, Pittsburgh, had 1935 net earnings of \$257,512 after all charges including depletion and Federal taxes, equal to approximately 44c. a share on 577,944 shares outstanding.

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The 1935 earnings compare with \$277,547 in 1934, or 48c. a share.

M. A. Hanna Co., Cleveland, had net profit of \$1,903,453 for 1935, as against \$1,726,647 for 1934.

Valley Mold & Iron Corp., Hubbard, Ohio, had 1935 net profit of \$313,395, or \$1.79 a share on 96,920 common shares, compared with net of \$33,834 for 1934.

Wheeling Steel Corp., Wheeling, W. Va., will distribute dividend of 50c. a share accumulated on the 6 per cent preferred stock, payable April 1 to holders of record March 15, leaving arrearage of \$24.50 a share.

Worthington Pump & Machinery Corp., Harrison, N. J., reports 1935 net loss at \$95,387, against 1934 net loss of \$1,083,197.

Pittsburgh Screw & Bolt Corp., Pittsburgh, reports for 1935 approximate loss of \$46,000, compared with 1934 net profit of \$228,690.

Reynolds Metals Co., Inc., Louisville, Ky., and subsidiaries report consolidated net profit for 1935 of \$1,419,267 after provisions for taxes and depreciation, compared with \$1,642,461 in 1934.

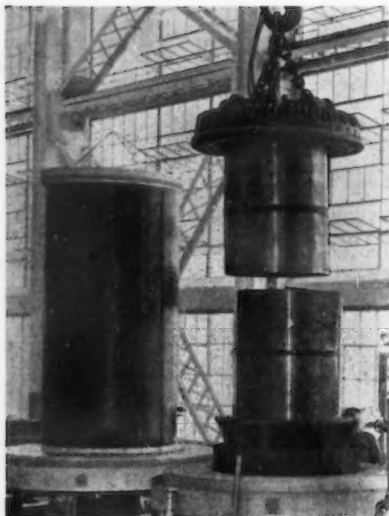
Laclede Steel Co., St. Louis, reports net profit for 1935 of \$227,350, equivalent to \$1.10 a share, compared with 50c. a share in 1934. At the close of the year, net working capital was \$1,996,889, an increase of \$132,130. On May 1, the company retired its \$650,000 issue of 5½ per cent two-year notes, maturing Nov. 1, 1935, and sold \$750,000 3 per cent notes, maturing May 1, 1938. The additional \$100,000 was expended in additions and improvements to plant and equipment, with the result that the company found itself better situated to profit from operations.

Trade Notes

Lincoln Electric Co., Cleveland, has moved its Pittsburgh office to 926 Manchester Boulevard. F. M. Maichle, is district manager.

National Automatic Tool Co., Richmond, Ind., manufacturers of drilling, boring, and tapping machines and associate equipment, has appointed R. S. Brown as Eastern sales representative with headquarters at New York.

Feenaughty Machinery Co., Portland, Ore., has been appointed distributor for Link-Belt shovels, cranes and draglines, in the Pacific Northwest territory. Branches are located in Seattle and Spokane, Wash., and Boise, Idaho.



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BRAKES • LIMIT STOPS and LIFTING MAGNETS.**

Wickwire-Spencer Reorganization Plan

A SPIRITED contest for purchase of securities of the Wickwire-Spencer Steel Corp. has been waged by the Republic Steel Corp., and the Bethlehem Steel Corp., according to reports here in connection with the reorganization plan for the Wickwire company now pending in Federal court.

It is further reported that the Republic Steel Corp. has purchased through Schoellkopf, Hutton & Pomeroy, Buffalo securities house, Class B notes in the amount of \$3,040,000, delivery of which will be made to Republic following final approval of the Wickwire-Spencer reorganization plans by the court.

The notes, convertible into common stock of the proposed Spencer Wire Products Corp., will represent approximately 10 per cent of the new stock outstanding.

Purchases of the notes are said to have been made from the Marine Trust Co. in the amount of \$1,240,240 and from the Manufacturers' & Traders' Trust Co. in the amount of \$399,000. Bethlehem also, according to Russell J. H. Hutton of the securities firm, was desirous of purchasing these securities.

Objections to reorganization were made by Charles A. Roberts, New York, representing Class A bondholders, and by Maxwell Brandwen, New York, representing bondholders to the amount of \$611,000.

While it appears probable that the court will approve the plan of reorganization, it is considered likely that an appeal will be taken by the interests represented by Messrs. Roberts and Brandwen. Mr. Roberts even recommended liquidation of the company rather than reorganization, contending that his clients would receive approximately 90 per cent of the face value of their holdings.

Pipe Line

Continental Oil Co., Ponca City, Okla., plans new welded steel pipe line from Tepetate oil and gas field area, near Eunice, La., to Lake Charles, La., about 45 miles, for natural gas transmission to plant of Mathieson Alkali Works at last noted place. New line will parallel a similar pipe line to be built between same points for oil transmission to new bulk oil storage and distributing plant of Continental company on Calcasieu River, near Lake Charles, for which contract recently was let to Apex Construction Co., Second National Bank Building, Houston, Tex.

Middlesex Pipe Line Co., an interest of Sun Oil Co., Philadelphia, has secured permission for new steel pipe line from Oak Tree and Newark, N. J., where connection will be made with bulk terminal of last noted company for gasoline supply.

Magnolia Pipe Line Co., Magnolia Building, Dallas, Tex., affiliated with Magnolia Petroleum Co., same address, has let contract to Mitchell-Stewart, Inc., same address, for new 8-in. welded steel pipe line from Fitts oil field district, Pontotoc County, Okla., to point near Konawa, Okla., about 18 miles, for crude oil transmission. Cost over \$100,000.

General Purchasing Officer, Panama Canal, Washington, asks bids until March 19 for 6520 ft. of welded steel pipe; also for 2400 ft. of cast iron soil pipe (Schedule 3128).

Little Rock, Ark., will take bids soon for new main trunk line for water system,

about 168,000 ft., with alternates on 44-in. electrically-welded steel pipe, 39-in. reinforced and steel core concrete pipe, and 39-in. cement-lined high-pressure cast iron pipe. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Tacoma, Wash., asks bids until March 13 for 18,915 ft. of 48-in. steel pipe, with alternate bids on concrete pipe, for main gravity pipe line from Green River for water system. W. A. Kunigk is city water superintendent in charge.

Shoreline Refining Co., Shreveport, is considering new welded steel pipe line from oil field district at Rodessa, La., to oil refinery at Lewis, about 13 miles, for crude oil transmission.

Central Arizona Light & Power Co., Phoenix, Ariz., plans welded steel pipe line to Chandler, Ariz., from connection with present main natural gas pipe line, for local gas distribution.

Board of Commissioners, Water District No. 42, King County, Wash., H. A. Cross, secretary, care of Parker & Hill, Smith Tower Building, Seattle, consulting engineers, asks bids until March 10 for 249,595 ft. of 1½ to 12-in. steel pipe for main water system; also for 100,000 gal. storage tank, gate valves and fittings.

Treasury Department, San Bernardino, Cal., has awarded 150 tons of steel pipe to an unnamed bidder.

Treasury Department, Fresno, Cal., has placed 125 tons of steel pipe with an unnamed bidder.

Manual Devoted to Ball Bearings

COMPREHENSIVE data covering the selection, application and operation of anti-friction bearings, and ball bearings in particular, are presented in an unusually attractive, 197-page, wire-bound engineering manual issued by the Fafnir Bearing Co., New Britain, Conn.

The book is divided into five sections, the first of which reviews the history of anti-friction bearings, and improvements which have expanded their fields of usefulness. Section II is devoted to a broad analysis of bearing selection on the basis of type, size and life expectation. Dimensions, load ratings and functional characteristics of a complete list of bearing types and sizes, including industrial pillow blocks and roller, as well as ball, bearings are reviewed in section III, which comprises 118 pages. This is followed by a section dealing with shaft fitting methods, housing and mounting instructions and suggestions as to lubrication. Section V comprises a separately bound list of prices and weights. Requests for copies of this new publication, designated as the engineering manual No. 35, should be made on company letterheads.

Weil-McLain Co., 641 West Lake Street, Chicago, has been appointed distributor in Chicago territory for the plumbing ware division of Briggs Mfg. Co., Detroit. Complete line of Brigsteel Beautyware will be handled.

Railroad Business Still Features New York Trade



Norfolk & Western Announces
Large Program—New Haven Inquiries for Locomotives—Construction Activity Is Increasing

NEW YORK, March 3.—General demand for finished steel products has improved in the last week and February tonnage booked by local sales offices was considerably larger than that taken in January or in February, 1935. However, orders from the railroads have predominated and continue to be the most active factor in this market.

The Norfolk & Western has come into the market for 20,000 tons of rails and has also announced its intention to build 1000 hopper cars and five locomotives in its own shops. The New York, New Haven & Hartford is definitely in the market for 15 steam locomotives in addition to the Diesel units it placed recently, but has not decided definitely about its freight and passenger car program. The recent Interstate Commerce Commission order which reduced passenger train fares will have some effect upon equipment purchases, but opinions differ as to whether it will be favorable or otherwise.

The Third Avenue Railways in New York are inquiring for 100 modern street cars and will purchase additional units over the next five years.

The American Bridge Co. has taken 3100 tons of fabricated structural steel for a warehouse in Manhattan and will also supply 1500 tons to the New York Central Railroad for highway elevation from Seventy-ninth to Eighty-second Streets. Track depression and highway elevation work on this project from Eighty-second to 129th Street will eventually require 25,000 to 30,000 tons of steel which will be let in several sections over the remainder of the year. The Bethlehem Steel Corp. has booked 1800 tons of shapes for a public school in Brooklyn.

The finished steel price structure in this area is being subject to severe test, but is holding remarkably well on the heavy hot-rolled products. On reinforcing bars, mills have announced a minimum price to distributors of 1.75c.,

Pittsburgh, and distributors are expected to bring their resale price up to 2.05c. Sheet and strip prices continue weak, pending the announcement of second quarter quotations. The current official levels are expected to be reaffirmed, but consumers will be given opportunity to cover this month at the now rather prevalent concession of \$3 a ton. Merchant wire prices are still unsettled.

Demand for tin plate continues relatively good, but is expected to show more improvement as the month goes on.

Pig Iron

Books for the second quarter were opened today, and prices are unchanged. Although in no greater volume than heretofore, last week's sales were supported by improved shipment instructions. As a result of more temperate weather, new inquiry is likewise heavier. It was established in certain directions today that a written inquiry for 600 tons of iron for extensive second quarter delivery is circulating in the market. A number of Brooklyn foundries whose stocks are low are simply waiting for the ground to dry out before ordering, and appearance of this demand in the market should aid pending sales considerably. The subject of toll rates proposed for the State canal has recently gained some publicity. If this action should be taken, freight savings on barge shipments of iron should become less a factor in the future.

Reinforcing Steel

The reinforcing market with the advent of warmer weather is slowly improving. Last week saw increased activity and brought promise of more in the future. New Jersey at present is the most consistent source of work, with a great deal of highway repairs on bridges, culverts, etc., taking place. Concrete Steel Co. was awarded 175 tons for an addition to the Yankee Stadium and 140 tons for two bridges on New Jersey highways. Prices have been reported as much

firmer than previously and much of the price difficulty seems to have been eliminated.

Scrap

Better weather has accelerated the movement of scrap, but the total tonnage turnover is still far under the volume which moved prior to the recent period of severe winter weather. It is probable that another month will pass before market deliveries increase to a normal level. In the meantime, brokers are finding a ready market for what tonnages dealers are delivering to them. Loadings of No. 1, No. 2 and cast on barges for export are taking about 75 per cent of the scrap coming out at the present time. Prices alongside barges for No. 1 and No. 2 are at least \$9.25 and \$8.25, with 25c. higher frequently being paid. New export business has been placed here, mostly for protracted delivery inasmuch as no broker is willing to sell any tonnage for nearby delivery until the weather clears up and the market trend becomes more dependable. There are a number of short orders in eastern Pennsylvania, consequently any scrap accumulation in nearby Jersey is finding a ready market. For these rail deliveries, brokers are generally willing to pay \$10.50 and \$9.50 for No. 1 and No. 2, respectively.

Birmingham Rail Mill Well Booked

BIRMINGHAM, March 3.—Missouri Pacific has placed an order for 2500 tons of rail with the Tennessee Coal, Iron & Railroad Co. and it now looks as if the Ensley rail mill will operate well into the summer.

Second quarter books for iron and steel have been opened, with prices remaining unchanged. Pig iron buying is expected to be light for the next month or six weeks, as foundries are well covered for the present. The base price for both current and second quarter business is \$15.50. Demand for sheets and wire products is still dragging. Not enough time has elapsed since the ice, rains and snow of January and February to improve buying. There is a fair run of plate, bar and structural steel orders.

There is no change this week in blast furnace and open-hearth operations, with 12 blast furnaces and 15 open-hearths in production.

Scrap buying and shipments have lately improved and prices are firmer and higher.

Better Sand Blasting



For the better, faster, more economical cleaning of metals, we furnish:

Abrasives—A wide range of mineral abrasives—a size for every cleaning purpose. Also steel and metallic.

Nozzles—Stoody Borium Nozzles—they resist wear, effect faster blasting, cut air cost. Also hard alloy iron nozzles, all sizes.

Engineering Service—Great Lakes Engineers are equipped with training and experience to examine your cleaning room problems, recommend adjustment in equipment, advise proper selection of abrasive. This service is rendered without charge by *engineers*—not salesmen! Ask us about it.

GREAT LAKES FOUNDRY SAND CO.

United Artists Building

Detroit, Michigan

Fabricated Structural Steel

Lettings Again Decline—New Projects Also Lower

AWARDS of 14,000 tons are mostly in small lots and compare with 25,950 tons last week. The only sizable booking is 6300 tons for marine beams and purlins for Fort Peck, Mont. New projects of 11,350 tons compare with 21,805 tons in the previous week and 13,600 tons two weeks ago. With the exception of about 7500 tons for bridges in the Central and Eastern states, the only new jobs of size are 1000 tons for high school additions in Philadelphia and 850 tons for a garage in Boston for the Boston Railway Express. Plate awards total 2215 tons, with 5400 tons pending. Structural steel contracts in February called for 94,255 tons compared with 101,770 tons in January. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Medford, Mass., 200 tons, city office building to Lehigh Structural Steel Co.

New York, 140 tons, building at 437 West Thirteenth Street, to Jones & Laughlin Steel Corp.

Carman, N. Y., 280 tons, New York Central grade crossing, to Phoenix Bridge Co.

Port Ivory, Staten Island, 125 tons, additions for Procter & Gamble Co., to Frederick Wolfe, Inc.

Fort Schuyler, N. Y., 125 tons, alterations to Fort Schuyler, to Harris Structural Steel Co.

Homestead, Pa., 215 tons, Mesta Machine Co., machine shop extension, to Bethlehem Steel Corp.

Washington, Pa., 100 tons, Washington Tin Plate Co. building, to Guibert Steel Co.

Washington, D. C., 140 tons, underpass, to Dietrich Brothers Co.

SOUTH AND SOUTHWEST

Hopemount, W. Va., 170 tons, State hospital, to Riverside Steel Co.

Louisville, Ky., 205 tons, Frankfort Distilleries, 520 barrel racks, to Bedford Foundry & Machine Co.

Tarboro, N. C., 150 tons, Hart Cotton mills building, to Richmond Structural Steel Co.

Florida Keys, Fla., 765 tons, highway bridge, to Bethlehem Steel Corp.

Port Arthur, Tex., 155 tons, eight vertical tank towers, Gulf Oil Corp., to Petroleum Iron Works.

Hill County, Tex., 265 tons, overpass, to North Texas Iron & Steel Co.

Montague County, Tex., 265 tons, underpass, to North Texas Iron & Steel Co.

Webb County, Tex., 140 tons, underpass, to Alamo Iron Works.

Bell County, Tex., 135 tons, underpass, to North Texas Iron & Steel Co.

Ajo, Ariz., 195 tons, flotation cell materials for Phelps Dodge Corp., to Bethlehem Steel Corp.

CENTRAL STATES

State of Indiana, 475 tons, bridges, to Central State Bridge & Iron Co.

Detroit, 425 tons, Chevrolet power house, to Whitehead & Kales Co.

Grand Rapids, Mich., 120 tons, breeching and stack, Fisher Body Corp., to Jones & Laughlin Steel Co.

Quincy, Ohio, 145 tons, State highway bridge, to Bethlehem Steel Corp.

Chicago, 100 tons, Grand Avenue bridge repairs, to Bethlehem Steel Corp.

Chicago & Northwestern, 365 tons, bridges at Kenosha, Wis., to Bethlehem Steel Corp.

Grand Forks, N. D., 285 tons, high school building, to St. Paul Foundry Co.

Omaha, Neb., 400 tons, Bartmettler Biscuit Co. plant, to Truscon Steel Co.

WESTERN STATES

Denver & Rio Grande Railroad, 600 tons, six bridges, to American Bridge Co.

Fort Peck, Mont., 6300 tons, marine beams and purlins, to American Bridge Co.

Los Angeles, 300 tons, Sears-Roebuck Co. building, to Minneapolis-Moline Power Implement Co.

Los Angeles, 299 tons, Iron Mountain pumping plant, to Consolidated Steel Corp., previously reported to an unnamed bidder.

Salem, Ore., 583 tons, State undercrossing, to Poole & McGonigle.

Canal Zone, 120 tons, naval ammunition depot, to Belmont Iron Works.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Hopkinton, N. H., 170 tons, State bridge.

Wells, Me., 147 tons, State bridge.

Charlestown, Mass., 100 tons, brewery plant addition.

Boston, 800 tons, Railway Express garage alterations.

State of New York, 275 tons, highway bridges.

Central Railroad of New Jersey, 500 tons, grade crossing elimination at Westfield, N. J.

Philadelphia, 1000 tons, North East high school additions.

State of Pennsylvania, 975 tons, highway bridges.

Allegheny-Westmorland Counties, Pa., 120 tons, bridge; bids March 20.

Columbia, Pa., 270 tons, bridge; bids March 20.

Wilmington, Del., 125 tons, garage; bids in.

CENTRAL STATES

Cleveland, 250 tons, horticultural building, for Great Lakes Exposition.

Columbus, Ohio, 2500 tons, State bridges, including 1300 tons for Black River viaduct, 500 tons for Pennsylvania grade crossing elimination near Bedford, and 500 tons for several small bridges; bids March 17.

Detroit, 250 tons, foundry for Packard Motor Co.

State of Indiana, 710 tons, highway bridges; bids March 10.

State of Illinois, 1200 tons, highway bridges; bids March 13.

State of Illinois, 320 tons, highway bridges at Streator and Amboy.

Quincy, Ill., 100 tons, postoffice; opening of bids postponed to March 10.

State of Nebraska, 400 tons, highway bridges.

WESTERN STATES

American Falls, Idaho, 100 tons, State overhead crossing; bids opened.

San Diego, Cal., 200 tons, postoffice; plans being prepared.

San Diego, 500 tons, Mount Palmer observatory; bids expected soon.

San Rafael, Cal., 400 tons, hotel; plans being prepared.

Pullman, Wash., 400 tons, stadium at Washington State College; bids opened.

FABRICATED PLATES

AWARDS

Jersey City, N. J., 315 tons, 82,000 bbl. tank for Public Service Electric & Gas Co., to Dover Boiler Works.

San Francisco, 475 tons, 36 and 44-in. pipe for crosstown pipe line, to Western Pipe & Steel Co.

Inglewood, Cal., 150 tons, 24-in. pipe, to Western Pipe & Steel Co.

Los Angeles, 425 tons, Iron Mountain pumping plant, to Consolidated Steel Corp.

Barranquilla, Colombia, South America, 850 tons, placer mining dredge, to Lancaster Iron Works, Lancaster, Pa.

NEW PROJECTS

Medford, Mass., 1500 tons, relief sewer.

San Francisco, 1150 tons, 36-in. pipe for Treasury Department; Steel Tank & Pipe Co. low bidder.

Tacoma, Wash., 250 tons or 2050 tons, 48-in. pipe, alternates on steel and lock joint steel cylinder reinforced concrete; bids March 16.

Burlingame, Cal., 1500 tons, unit of Hetch Hetchy pipe line; bids expected within 60 days.

San Diego, Cal., 145 tons, gas tank; bids opened.

Aberdeen, Wash., 108 tons, steel pipe bands for city; bids opened.

SHEET PILING

NEW PROJECTS

Sheffield or Hobbs Island, Ala., 1000 tons; bids asked on used piling for Gunter'sville, Ala., dam, TVA project.

Los Angeles, 2500 tons sheet piling, Imperial dam on All-American canal; no date for bids.

Cleveland, 600 tons, dock improvements for Republic Steel Corp.

Reinforcing Steel

Awards 4350 Tons—New
Projects 4200 Tons

AWARDS

South Kingston, R. I., 125 tons, bridges, to Joseph T. Ryerson & Son, Inc.

New York, 175 tons, addition to Yankee Stadium, to Concrete Steel Co.

New York, 250 tons, sewer in Bronx, to Jones & Laughlin Steel Corp.

New York, 180 tons, sewer in Queens, to Jones & Laughlin Steel Corp.

State of New Jersey, 140 tons, two highway bridges, to Concrete Steel Co.

Harrisburg, Pa., 200 tons, Anderson dam, to Bethlehem Steel Corp.

Chicago, 650 tons, plant at Central Manufacturing District for Albert Pick Co., to Joseph T. Ryerson & Son.

Chicago, 150 tons, Kraft-Phenix Cheese Co., to an unnamed bidder.

State of Illinois, 100 tons, paving, to Concrete Engineering Co.

State of Illinois, 500 tons, miscellaneous paving work, to unnamed bidders.

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ANY METAL-ANY PERFORATION

Los Angeles, 1100 tons, General Motors assembly building, to Jones & Laughlin Steel Corp.

San Diego, Cal., 760 tons, material for Treasury Department, to an unnamed bidder.

NEW REINFORCING BAR PROJECTS

Bangor, Me., 100 tons, hospital unit.

State of New Jersey, 434 tons, highway bridge; H. C. Lewis, Newark, low bidder.

Chicago, tonnage being estimated, Chicago postal sub-stations.

Chicago, 240 tons, section T, Sanitary District; P. J. Albrecht, low bidder on general contract.

Springfield, Ill., tonnage being estimated, armory.

State of Illinois, 500 tons, bridges.

St. Louis, 108 tons, ward building at Koch Hospital; H. B. Deal & Co., St. Louis, low bidders on general contract.

Fort Peck, Mont., 1616 tons emergency tunnels; 16 identical bids submitted at \$79,156.58.

Sacramento, Cal., 500 tons, Public Works office building; bids March 24.

San Diego, Cal., 300 tons, strengthening of Hodges reservoir dam; bids March 10.

Los Angeles, 250 tons, warehouse for California Hardware Co.; bids soon.

Anaheim, Cal., 100 tons, addition to County hospital; bids opened.

Alhambra, Cal., 100 tons, Ramona school; bids opened.

Glendale, Cal., 200 tons, addition at Junior College; general contract awarded.

Tacoma, Wash., 900 tons, 48-in. pipe, alternates on steel and lock joint steel cylinder reinforced concrete pipe; bids March 16.

Pearl Harbor, T. H., 470 tons, extension to quay wall at Navy Base, Specification No. 8014; bids March 25.

Tax Program Would Be Business Burden

WASHINGTON, March 3.—The President's tax messages sent to Congress today, proposing graduated levies on undistributed corporate incomes, created considerable criticism on the grounds that it would be a further burden on business. Some members of Congress expressed doubt that the proposal would be adopted and that, if it were, it would be attacked in the courts as unconstitutional.

In addition to this suggestion, the President also recommended a direct tax designed to recapture as much as possible of processing taxes which have been unpaid and returned.

The graduated corporate tax, estimated to yield about \$1,614,000,000 for the 1936 tax year, on undistributed corporate income would be accompanied by repeal of the existing corporate income tax, capital stock tax, excess profits tax and of present exemptions on dividends from normal tax individual incomes.

The message was unexpected in that it made specific recommendations for taxation. Previously it was understood none would be offered by the President.

Lead Quotations Advance \$2 a Ton —Heavy Buying Accompanies Rise

Demand for Copper Lags as Prices Undergo No Change from Divided Basis—World Tin Supplies Increase 329 Tons

NEW YORK, March 3.—Copper sales are still being made on the basis of 9.25c. a lb., Connecticut Valley, but demand is less active as consumers are becoming accustomed to the division in market quotations, and apparently feel that there is less danger of a uniform advance to 9.50c. Those interests who originated the latter price, however, are steadfastly adhering to that level, and display no indications of weakening. Domestic sales in February totaled 78,653 tons, or more than twice the January figure of 33,167 tons. Yesterday 1376 tons were booked. Abroad the price for electrolytic has moved downward a bit, but appears to be steady at approximately 8.95c. a lb.

Zinc

Sales last week were heavy, as consumers sought to cover before application of the higher price for zinc of 4.60c. a lb. The bulk of approximate sales of 17,000 tons were negotiated at a price five points lower, and this situation, combined with heavy bookings two weeks ago, has given producers little chance so far to profit by the higher quotation. The 4.60c. level, however, is considered well established. Producers will simply have to await liquidation of consumer inventories before benefiting from the new market level. Ore prices are unchanged at \$31 and \$32 a ton.

Lead

Heavy buying of lead caused St. Joseph Lead Co. to initiate a \$1 a ton rise in the price on Feb. 26, which was immediately followed by the rest of the trade. On the day following, the price was again advanced \$1 a ton, this time upon the initiative of American Smelting and Refining Co. The dual action in this respect is one cause for believing the present quotation of 4.60c. a lb. is based upon a sound and justifiable market position. Although today and yesterday witnessed a considerable recession in demand, producers were able to move their intake in most cases due to waiting lists of customers whose needs could not be filled last week.

Tin

This market was little affected by publication of February statistics, since nothing startling was contained in the figures. The world's visible supply, including the Eastern and Arhem carry-over, increased 329 tons to 17,562 tons during January. Deliveries in this country decreased 1035 tons to 5600 tons. Supplies of tin in stock and on landing in New York increased 538 tons to 3523 tons by the month's close. Present spot tonnages are still relatively scarce, however, as consumers own the bulk of the above-mentioned supplies. The price today for spot Straits metal at New York remains at 48.00c., while in London this morning standard spot sold for £209 5s. and futures for £201 10s. The Eastern price was £207 5s.

The Week's Prices. Cents Per Pound for Early Delivery

	Feb. 26	Feb. 27	Feb. 28	Feb. 29	March 2	March 3
Electrolytic copper, Conn.*.....	9.25	9.25	9.25	9.25	9.25	9.25
Lake copper, N. Y.....	9.37 1/2	9.37 1/2	9.37 1/2	9.37 1/2	9.37 1/2	9.37 1/2
Straits tin, Spot, New York.....	47.87 1/2	48.87 1/2	48.37 1/2	....	48.00	48.00
Zinc, East St. Louis.....	4.90	4.90	4.90	4.90	4.90	4.90
Zinc, New York.....	5.27 1/2	5.27 1/2	5.27 1/2	5.27 1/2	5.27 1/2	5.27 1/2
Lead, St. Louis.....	4.40	4.45	4.45	4.45	4.45	4.45
Lead, New York.....	4.55	4.60	4.60	4.60	4.60	4.60

*Delivered Connecticut Valley; price 1/4c. lower delivered in New York.

†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19.00c.-22.00c. a lb., delivered.
Aluminum, No. 12 remelt, No. 2 standard, in carloads, 17.00c. lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 13.25c. a lb., New York.
Quicksilver, \$77.50 to \$80.00 per flask.
Brass ingots, commercial 85-5-5-5, 9.50c. a lb., delivered; in Middle West 1/4c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.	
Tin, Straits pig.....	48.50c. to 49.50c.
Tin, bar.....	50.50c. to 51.50c.
Copper, Lake.....	10.25c. to 11.25c.
Copper, electrolytic.....	10.25c. to 11.25c.
Copper, castings.....	10.00c. to 11.00c.
*Copper sheets, hot-rolled.....	16.50c.
*High brass sheets.....	14.62 1/2c.
*Seamless brass tubes.....	16.87 1/2c.
*Seamless copper tubes.....	17.00c.
*Brass rods.....	13.12 1/2c.
Zinc, slabs.....	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over.....	10.25c.
Lead, American pig.....	5.10c. to 6.10c.
Lead, bar.....	6.10c. to 7.10c.
Lead, sheets, cut.....	8.25c.
Antimony, Asiatic.....	14.00c. to 15.00c.
Alum., virgin, 99 per cent, plus.....	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent.....	18.50c. to 20.00c.
Solder, 1/2 and 1/2.....	29.50c. to 30.50c.
Babbitt metal, commercial grades.....	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.	
Tin, Straits pig.....	52.00c.
Tin, bar.....	54.00c.

Copper, Lake.....	10.25c. to 10.50c.
Copper, electrolytic.....	10.25c. to 10.50c.
Copper, castings.....	10.00c. to 10.25c.
Zinc, slabs.....	6.50c. to 6.75c.
Lead, American pig.....	5.20c. to 6.50c.
Lead, bar.....	8.50c.
Antimony, Asiatic.....	16.50c.
Babbitt metal, medium grade.....	19.00c.
Babbitt metal, high grade.....	56.00c.
Solder, 1/2 and 1/2.....	26.25c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	7.25c.	8.00c.
Copper, hvy. and wire.....	7.12 1/2c.	7.62 1/2c.
Copper, light and bottoms.....	6.12 1/2c.	6.62 1/2c.
Brass, heavy.....	4.00c.	4.62 1/2c.
Brass, light.....	3.25c.	4.00c.
Hvy. machine composition.....	6.00c.	6.50c.
No. 1 yel. brass turnings.....	5.12 1/2c.	5.62 1/2c.
No. 1 red brass or compos. turnings.....	5.62 1/2c.	6.12 1/2c.
Lead, heavy.....	3.50c.	3.87 1/2c.
Zinc.....	2.50c.	2.87 1/2c.
Cast aluminum.....	12.12 1/2c.	13.25c.
Sheet aluminum.....	13.25c.	14.75c.

Non-Ferrous Averages

The average prices for the major non-ferrous metals for February, based on daily quotations in THE IRON AGE, are as follows:

	Average
Electrolytic copper, Conn.†... 9.250c. a lb.	
Lake copper, Eastern delivery.....	9.375c. a lb.
Straits tin, spot, N. Y.....	47.941c. a lb.
Zinc, East St. Louis.....	4.860c. a lb.
Zinc, New York.....	5.235c. a lb.
Lead, St. Louis.....	4.365c. a lb.
Lead, New York.....	4.515c. a lb.

†Price 1/4c. lower in New York.

Ingot Brass and Bronze

January deliveries of brass and bronze ingots by members of the Non-Ferrous Ingot Metal Institute totaled 5948 tons. During 28 days ended Feb. 21, average prices received by its members for commercial 80-10-10 and commercial 85-5-5-5 brass ingot were 10.790c. and 9.268c. a lb. respectively. Preceding prices were 10.806c. and 9.306c. a lb.

Activities Bearing on Machine Tool Distribution

A Department Conducted by L. M. Waite

ONE man's guess may be said to be as good as another's in connection with anticipated orders which do not seem to be released from mass production fields. A prominent manufacturer in this connection calls to our attention the viewpoint that machine tool buying is no longer a mere matter of huddles between operating and financial executives of plant organizations. He says that in mass production, methods and materials have become the primary factors in cost competition. He ventures that there is a lessening advantage to be gained through purely machine elements of production in highly competitive fields, largely because all manufacturers enjoy practically the same opportunities for the purchase of machines. After installation, all can enjoy practically the same results from operation.

As an example, he refers to the three or four leading makes of automobiles in the low-priced field, and states that these cars, as they roll from the assembly lines, represent very little difference in costs. He contends that the big hunt is for materials and methods of production which will reduce weight and present advantages for exclusive use either through patents or contracts. Weight reductions of fractional poundage, he states, are of vital importance, running into thousands of dollars, because low-priced cars and their equipments have weight-carrying limits which determine the fuel consumed. He calls attention to the standing attained, in automobile and kindred productions, by relatively new methods and the lighter materials and synthetic products. He states that additional important developments in parts fabrication are sufficiently close to fruition to create caution in planning, other than that of a replacement nature.

He states that the new flexibility in machine tools has voided much caution that would have otherwise been necessary, from a buying viewpoint, during the past six months. "New processes do not

eliminate necessity for tools; they merely change the types of tools in many instances. Machine makers," he states, "are our experienced heads of production, and, for one, I would like to see them branching out into those lines which are certain to utilize new materials and methods which have been successfully demonstrated. Outside of heretofore called standard materials, the machine tool industry has done very little pioneering but has been, rather, content to meet new processes from the viewpoint of driving competition."

Territorial Activity

METROPOLITAN AREA.—Dealers operating in this territory and also having offices in other areas report a continued satisfaction with machine tool order and inquiry situation during the first two months of 1936. The buyers of individual machines are closing orders for equipments which have been under consideration for some time past. Hesitancy as to this class of buying seems to have very largely vanished, as is evidenced by a satisfactory and possibly unexpected total of business from these sources.

SOUTHWESTERN AREAS.—From this section of the South reports are that machine tool activity is holding its late 1935 ground with a somewhat increased volume of orders in the moderate-priced tools. Inquiries are said to be active.

THE SOUTHERN AREA.—Inquiries are reported as considerably increased during the first six weeks of 1936, while sales have increased slightly. The larger part of the business actually placed around the Atlanta area is said to involve unabused used machines. One southern dealer says, "We are looking forward to 1936 being a very good year in this line." This

particular dealer handles contractors' equipment, machine tools, tractors, woodworking machinery, power equipment and road machinery.

DETROIT AREA.—John Sauer, Peninsular Machinery Co., Detroit, is the new president of Detroit Area Machine Tool Dealers. George Turner, Strong, Carlisle and Hammond Co., is the new secretary-treasurer. H. C. Bayliss, Motch & Merryweather Machinery Co., is vice-president.

METROPOLITAN AREA.—R. K. Le Blond Machine Tool Co., Cincinnati, has announced the March 1 opening of a sales office and display room at 103 Lafayette Street, New York. W. E. Groene, associated with the company for the past eight years in the metropolitan area, will be in charge. The company's Cincinnati Electrical Tool Division eastern headquarters are included in the new arrangement.

NEW AGENTS have been announced by the Triplex Machine Tool Corp., New York, for distribution of Swiss jig boring machines made by Société Genevoise d'Instruments de Physique, Geneva, Switzerland. These include Jeffery-Gillis, Inc., Cleveland; W. E. Shipley Machinery Co., Philadelphia; F. W. Schiefer Machinery Co., Rochester, N. Y.; Marshall & Huschart Co., Indianapolis, Ind.; Barney Machinery Co., Pittsburgh; H. A. Smith Co., Syracuse, N. Y., and Galvin Machinery Sales, Buffalo, N. Y.

CLEVELAND AREA.—"Developments in machine tool activity in this area have been much brighter during the first two months of 1936 than at any time during the past five years, covering the corresponding period of the year. We have secured a lot of business on equipment ranging from \$50 to \$700. There is considerable combing of the market for high-grade used equipment in the higher priced brackets. A number of the makers whom we represent are enjoying a very good business and this is certainly encouraging. However, a great deal can still be done to restore the confidence of the machine tool buyer. The enlightening information in your publication helps to place facts before buyers and to remove certain elements of fear. This, of course, tends to better conditions all around."



Plant Expansion and Equipment Buying

Machine Tool Demand Shows Increase in Most Sections

MACHINE tool demand last week indicated a distinct increase in briskness, seemingly reflecting the cessation of the inclement weather. Automotive buying was responsible for the larger orders, with Lincoln and General Motors units in the market. Chevrolet is expected to buy shortly to equip a new motor line at Flint and Oldsmobile will make rehabilitation expenditures amounting to \$6,000,000.

The Navy Department has been making sizable tool purchases. A milling machine manufacturer reports last week's business the best so far this year. Heavy machinery demand is improved and the immediate prospects are reported bright.

Apprenticeship plans are being hastened by the growing shortage of skilled machine tool labor.

◀ NORTH ATLANTIC ▶

American Cyanamid Co., 30 Rockefeller Plaza, New York, has acquired over 4000 acres of phosphate lands near Fort Meade, Fla., and plans new works for phosphate production for agricultural purposes at that location. It will include mechanical washer, flotation mill, storage and distributing buildings, packing unit, machine shop and power house. Work on initial structure, mechanical washer plant, will begin at once, and will cost about \$100,000 with machinery, out of estimated cost of \$260,000 for complete works. Company is operating a branch plant at Brewster, Fla.

Department of Water Supply, Gas and Electricity, Municipal Building, New York, Maurice P. Davidson, commissioner, plans expenditure of about \$1,000,000 for new electrical lighting equipment, including cable and wire, conduits, fixtures and standards, transformers and accessories.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 10 for 660 water gage-glass fittings (Schedule 7320); until March 13, one coil-winding machine (Schedule 7346), 1296 welders' helmets without lenses (Schedule 7324), 800 vacuum tubes (Schedule 7357) for Brooklyn Navy Yard.

Jellinek Auto Radiator Co., 794 Tenth Avenue, New York, has leased building at 562½ West Fifty-second Street, and space in adjoining building at 562 West Fifty-second Street for new works.

Joseph E. Seagram & Sons, Inc., 405 Lexington Avenue, New York, affiliated with Seagram Distillers Corp., same ad-

dress, has leased plant of Old Kentucky Distillery, Inc., 2425 Lexington Road, Louisville, for new plant. Present units will be extended and considerable new equipment will be installed. Cost over \$150,000. Company will begin superstructures at once for main distillery on large tract acquired a few months ago at Louisville, to include power house, machine shop and other mechanical units, for which general contract recently was let to J. & E. Warm Co., 2335 Florence Avenue, Cincinnati. Plant will have working force of about 500 persons and will cost close to \$5,000,000 with equipment. Joseph & Joseph, Breslin Building, Louisville, are architects.

Signal Supply Officer, Army Base, Brooklyn, asks bids until March 17 for tape reels, tape pullers, tape rewinders, keying head drivers, keying heads, keying amplifiers, etc. (Circular 146); until March 17, submarine mine cable, one conductor, in lots of 100,000 to 140,000 ft. (Circular 147).

Department of Purchase, City of New York, Municipal Building, has filed plans for one-story equipment storage and distributing building, 55 x 145 ft., at Remsen Avenue and Avenue D, Brooklyn. Cost over \$200,000 with equipment. C. N. Ely is architect for department.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until March 12 for reworking 40,764 lb. scrap metal into 40,661 lb. brass rods, and reworking 10,000 lb. aluminum turnings into 10,000 lb. aluminum (Circular 243).

H. A. Smith Machine Co., Somerset Street and Hamilton Avenue, Hopewell, N. J., manufacturer of screw machine parts, meter registers, etc., has plans for one-story addition, for which superstructure will begin this month. Installation will include automatic presses and other tools. Cost over \$80,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 13 for six hydraulic pumping units with accessories, 36 valves and 12 motors (Schedule 7314); until March 17, 40,000 ft. flexible steel cable (Schedule 7326) for Philadelphia Navy Yard.

Crown Cork & Seal Co., Eastern Avenue and Cresson Street, Baltimore, has purchased about 18 acres at Erie Avenue and G Street, Philadelphia, for new main plant, to be operated in conjunction with local plant of Acme Can Co., 1026 West Alleghany Avenue, recently acquired. General contract for initial structure has been let to Engineering Contracting Corp., North and Linden Streets, Baltimore. Cost close to \$2,500,000 with equipment. Production facilities for cans and metal containers, as manufactured by Acme company, now a subsidiary, will be considerably increased, as part of project.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until March 9 for one blanking punch and die, and one shaving punch and die (Circular 355), static condenser units, 12-kva. capacity (Circular 354); until March 12, two bench filing machines (Circular 360); until March 17, reworking metals into 484,512 cartridge brass disks (Circular 337).

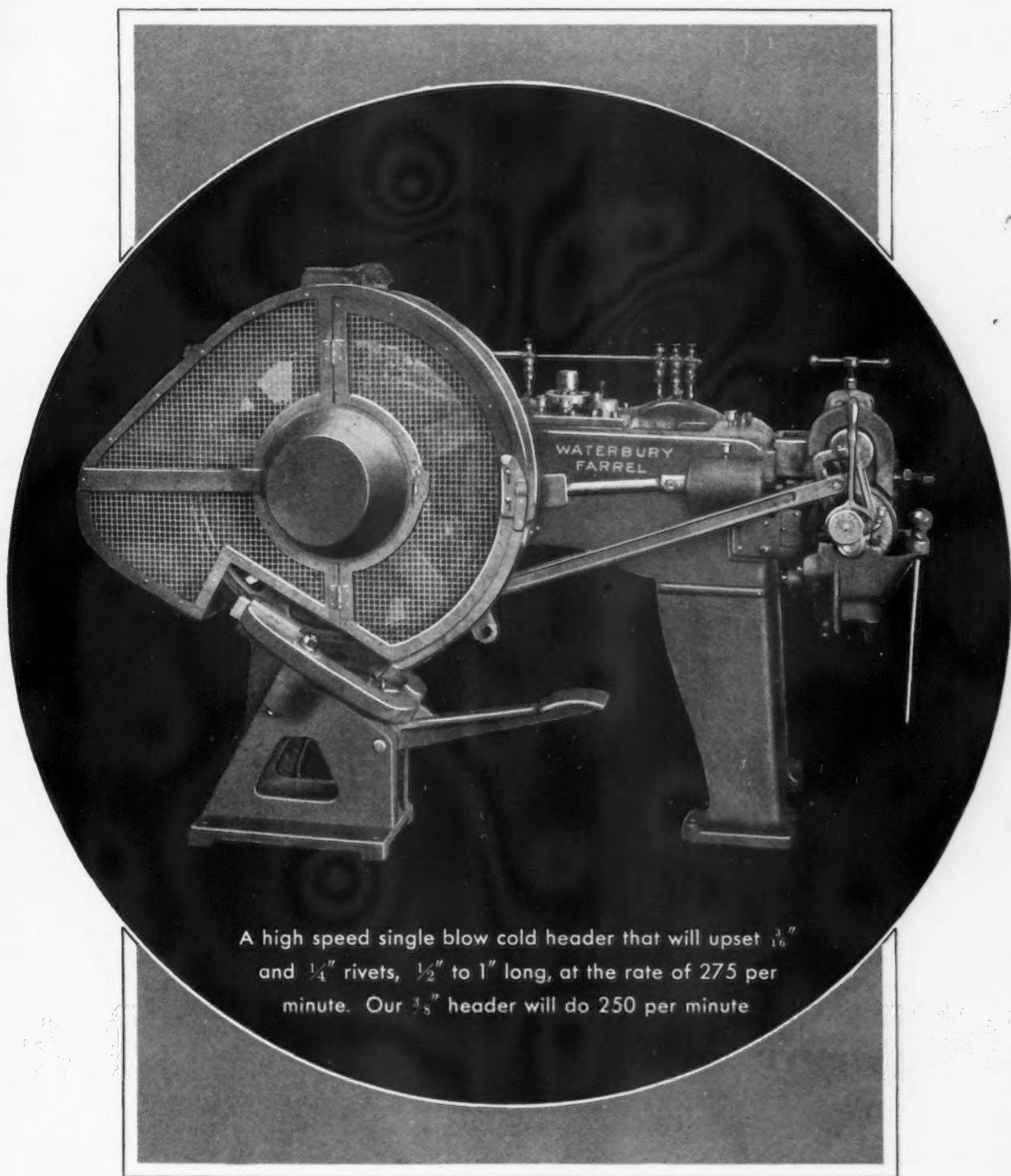
◀ NEW ENGLAND ▶

Connecticut Light & Power Co., Hartford, Conn., is arranging for expansion and improvements in power plants, power substations and other operating structures, including additional equipment; also for extensions in transmission and distributing lines, and service facilities. Fund of \$3,300,000 has been authorized.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until March 9 for rifle-cleaning rods (Circular 131); until March 10, hacksaw blades, slotting saws, cut-off blades, cutters, copper hammers, steel measuring tapes, turning chisels, die stocks, threading dies and other miscellaneous equipment (Circular 148); until March 12, one hollow chisel mortiser (Circular 128); until March 13, one high-speed wood router (Circular 130), one double-arbor universal wood-working saw (Circular 129); until March 16, rebuilding 10 indexing heads for milling machines (Circular 123), one wood rod machine (Circular 132); until March 17, one 30-in. knife grinder (Circular 136).

Commonwealth Brewing Co., Liberty Street, Springfield, Mass., plans extensions

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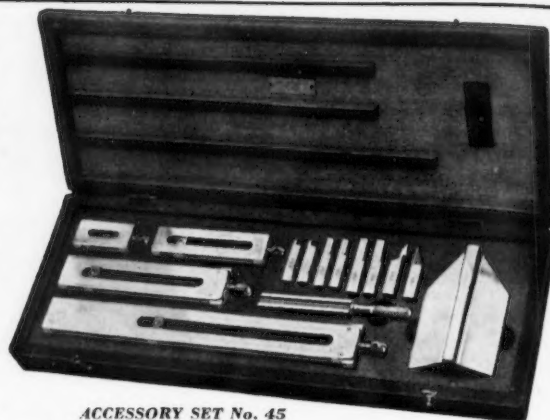
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and improvements, including new equipment. Cost close to \$50,000 with machinery.

Florence Stove Co., Gardner, Mass., manufacturer of domestic oil and gas pressure stoves, parts, etc., is acquiring a substantial interest in Wehrle Co., Newark, Ohio, manufacturer of stoves and parts, cookers, safes and kindred products, with branch plant at Lewisburg, Tenn., and die works at Coshocton, Ohio, and will be active in management. A new company is being organized to carry out merger. Florence company has work under way on two-story addition at Gardner plant, 150 x 300 ft., for storage and distribution, to cost over \$80,000 with equipment.

◀ WESTERN PA. DIST. ▶

Glasolier Co., 810 Penn Avenue, Pittsburgh, manufacturer of electric lamps and novelties, has leased about 16,000 sq. ft. floor space in building at 422 Boulevard of Allies, for new plant, increasing present capacity.

Viscose Co., Meadville, Pa., manufacturer of cellulose rayon products, has plans by Ballinger Co., 105 South Twelfth Street, Philadelphia, architect and engineer, for addition to double present capacity. Cost close to \$1,000,000 with machinery. Company headquarters are at 200 Madison Avenue, New York.

Franklin School Board, Franklin, Pa., William W. Dietz, secretary, plans manual training department in new three-story high school. Cost \$250,000. Bonds have been authorized, work to begin early in spring.

Chesapeake & Ohio Railroad Co., Barbersville, W. Va., plans rebuilding part of local reclamation plant recently destroyed by fire, including machine shop, pattern shop, forge and blacksmith shop. Loss about \$50,000 with equipment. E. L. Bock is general superintendent. Main offices are at Richmond, Va.

◀ SOUTHWEST ▶

Missouri State Building Commission, Capitol Building, Jefferson City, Mo., has authorized new power house at institution at Mount Vernon, Mo., and will take bids soon. Cost about \$200,000 with equipment. Baumes-McDevitt Co., Railway Exchange Building, and Ralf Toensfeldt, Security Building, both St. Louis, are consulting engineers; Charles A. Haskins, Finance Building, Kansas City, Mo., is supervising engineer.

International Printing Ink Corp., 102 Dock Street, St. Louis, plans rebuilding part of plant recently destroyed by fire. Loss close to \$100,000 with equipment.

United States Engineer Office, Manufacturers' Exchange Building, Kansas City, Mo., asks bids until March 9 for 210,000 ft. of galvanized wire strand, 3/8-in. diameter (Circular 530).

Board of Education, El Dorado, Kan., plans manual training shops in new one, two and three-story high school, for which

general contract has been let to Reinhart & Donovan, Commerce Exchange Building, Oklahoma City, Okla. Cost about \$400,000. Thomas W. Williamson & Co., National Bank of Topeka Building, Topeka, Kan., are architects.

St. Joseph Railway, Light & Power Co., St. Joseph, Mo., plans extensions and improvements in electric power plant, including new turbo-generator unit, condenser, pumping machinery, transformers and auxiliary equipment. Cost close to \$450,000.

Commercial Iron Works, Second National Bank Building, Houston, Tex., C. R. Cotton, head, have acquired property at Mack and Esperson Streets for one-story plant, for which superstructure will soon begin. Cost about \$35,000 with equipment.

Seven-Up Bottling Co., Houston, Tex., has leased three-story building at 2202-6 Leeland Street, and will remodel for mechanical-bottling works. Cost close to \$30,000 with automatic and other machinery.

◀ BUFFALO DISTRICT ▶

Vanadium Corp. of America, Inc., Saunders Settlement Road, Niagara Falls, N. Y., has let general contract to Walter S. Johnson Building Co., Inc., 2532 Hyde Park Boulevard, for one-story addition. Cost over \$85,000 with equipment. Headquarters of company are at 120 Broadway, New York.

United States Engineer Office, Federal Building, Buffalo, asks bids until March 9 for union couplings, conduit couplings, wiremold receptacle boxes, fuse links, switches, elbows and other supplies (Circular 90); until March 10, two aluminum alloy pontoons and all aluminum accessories, with fastenings and connections, including deck clamps, deck angles, etc.; also galvanized pipe spacers, bolts, nuts, washers, etc., for construction deck sections and pontoon assembly (Circular 91).

Elmira Precision Tool Corp., Elmira, N. Y., organized a few months ago to take over former plant of Willys-Morrow Co., South Main Street, will specialize in production of parts for accounting and tabulating machines, typewriters, etc., as manufactured by Remington-Rand, Inc., Buffalo, and will operate in close cooperation with last noted interest. Improvements are being made in plant, to include installation of considerable new equipment. Ransome T. Lewis is president.

◀ SOUTH ATLANTIC ▶

Tidewater Power Co., Wilmington, N. C., plans extensions in transmission and distributing lines for rural electrification in several Eastern counties, about 125 miles, with power substation and service facilities. Cost \$140,000. Financing has been arranged through Federal aid.

Saylors & Massia, Sparta, Ga., textile mill equipment, have approved plans for one-story mill for manufacture of shuttles, parts and allied equipment for cotton mills. Cost about \$25,000 with equipment.

United States Engineer Office, Jacksonville, Fla., asks bids until March 9 for two cast steel propellers (Circular 256).

Atlantic Ice & Coal Co., Atlanta, Ga., is considering erection of new brewery at Charlotte, N. C., comprising main multi-story building and auxiliary units. Cost over \$75,000 with equipment. Similar plant is also being considered at or near Norfolk, Va.

◀ OHIO AND INDIANA ▶

Lockwood Mfg. Co., 3170 Wasson Road, Cincinnati, manufacturer of bakery pans and kindred metal utensils, has let general contract to Ferro Concrete Construction Co., Cincinnati, for one-story addition, 42 x 250 ft. Cost over 50,000 with equipment. John H. Deeken, 800 Broadway, is architect.

Iron Fireman Mfg. Co., 3170 West 106th Street, Cleveland, manufacturer of stokers and parts for domestic service, has let general contract to Austin Co., Euclid Avenue, for one-story addition, about 38,000 sq. ft. floor space. Cost close to \$100,000 with equipment. Company headquarters are at Portland, Ore.

Frieberg & Workum Distillery, Lynchburg, Ohio, inactive for several years, has been acquired by new interests, headed by John L. Bennett, president, United States Mfg. Co., Decatur, Ill., manufacturer of wire goods, and Dr. William J. Lenz, Starks Building, Louisville. Plant will be modernized and new machinery installed. Cost over \$100,000 with equipment. Company is being organized with capital of \$500,000 to carry out project, of which Dr. Lenz will be president and Mr. Bennett, vice-president.

Wise Foundry, Machine & Supply Co., Zanesville, Ohio, plans early rebuilding of machine shop, recently destroyed by fire. Loss about \$40,000 with equipment.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until March 9 for one magnetic starter and one electric dynamometer (Circular 588), 288,500 electrical terminals, copper soldering lug (Circular 587), 2400 combination pliers and 2525 diagonal cutting pliers (Circular 596); until March 10, wood screws, various sizes (Circular 593), two four-wheel balloon winch trucks, four-wheel drive (Circular 584); until March 11, 24,900 compensating compass magnets (Circular 605), 56,000 wire cable thimbles (Circular 599); until March 12, resistors, various kinds (Circular 601); until March 13, ammunition box assemblies, gun mount adapter assemblies, 2008 bomb shackle assemblies (Circular 594).

Truck Engineering Co., 3130 East Pontiac Street, Fort Wayne, Ind., manufacturer of motor truck bodies, hoists, etc., has asked bids on general contract for one-story addition, 40 x 140 ft. Cost over \$50,000 with equipment. C. A. Croteaux is president.

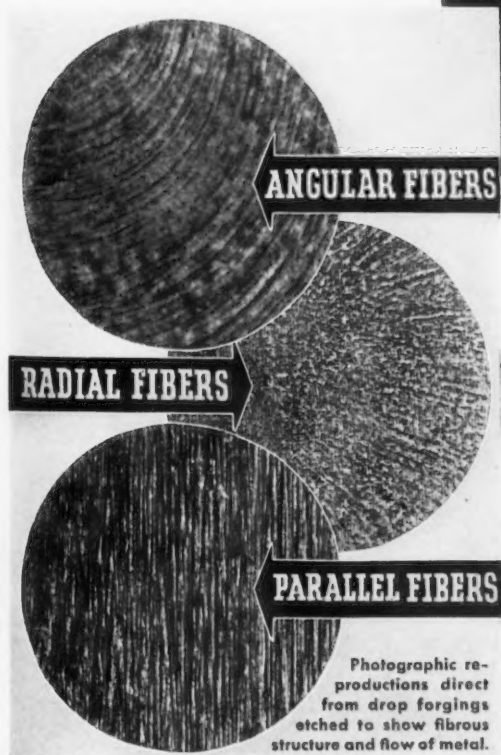
Contracting Officer, Quartermaster Corps, Jeffersonville, Ind., asks bids until March

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9 for about 225,000 lb. animal shoes and 4600 lb. horseshoe nails (Circular 206).

◀ MICHIGAN DISTRICT ▶

Leonard Refrigerator Co., Grand Rapids, Mich., a division of Kelvinator Corp., Detroit, has let general contract to Barnes Brothers Construction Co., Grand Rapids, for two one-story additions, primarily for storage and distribution. Cost close to \$50,000 with equipment.

Ford Motor Co., Dearborn, Mich., has plans for one-story branch plant at Milan, Mich., for parts production. Cost over \$70,000 with machinery. Close to 100 workers will be employed.

Naph-Sol Refining Co., Muskegon, Mich., plans new steam power plant at oil refinery at North Muskegon, Mich. Cost about \$25,000 with boilers and auxiliary equipment.

Michigan State Prison Board, Lansing, Mich., has plans for new one-story service, storage and distributing building, 90 x 400 ft., at institution at Jackson, Mich. Cost close to \$100,000 with equipment. Bowd & Munson, Lansing, are architects.

Chrysler Corp., 341 Massachusetts Avenue, Detroit, will soon begin superstructure for one-story addition to branch plant at Marysville, Mich., for which general contract recently was let to Walbridge-Aldinger Co., 409 Griswold Street, Detroit. Cost over \$50,000 with equipment.

◀ WASHINGTON DIST. ▶

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until March 23 for four 750 gal. per min. water pumps with accessories (Circular 110).

Lynchburg Foundry Co., Lynchburg, Va., plans one-story addition to foundry at branch works at Radford, Va., about 100 x 370 ft., primarily for production of centrifugal cast iron pipe, including casting, annealing and cleaning divisions. Other improvements will also be made. Present casting process in existing units will be continued as heretofore. Cost about \$400,000 with equipment.

Chief, Resettlement Purchase Section, Treasury Department, Washington, asks bids until March 9 for complete equipment for new incinerator at Branchville, Md., with rated capacity of 18 tons in 24 hrs. (Proposal 679).

Quartermaster, Marine Corps, Washington, asks bids until March 9 for two cross-cut circular saws, 48 cutter mattocks, 72 pick mattocks, sealer tools, etc. (Schedule 596).

Owings Mills Distillery Co., Owings Mills, Md., has let general contract to Walter Tovell, Inc., Eutaw and Monument Streets, Baltimore, for multi-story addition

for storage and distribution. Cost over \$75,000 with equipment. Kubitz & Koenig, Emerson Tower Building, Baltimore, are consulting engineers.

Chemical Warfare Service, Edgewood Arsenal, Md., asks bids until March 9 for one carbon dioxide exhauster, direct-connected, motor-driven centrifugal type, and for one carbon dioxide heater (Circular 55).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 10 for two motor-driven semi-automatic thread milling machines for Washington Navy Yard (Schedule 7274), oil fillers, steel oilers, etc., for Boston, Brooklyn, Mare Island, Puget Sound and other yards (Schedule 7264); oil and grease cups (Schedule 7283), tools and wrenches, water gages, etc. (Schedule 7310), alloy steel forgings (Schedule 7160) for Eastern and Western yards; until March 13, one motor-driven steel forming press brake for Boston yard (Schedule 7348); alloy and carbon steel forgings for Newport, R. I., yard (Schedule 7345).

◀ MIDDLE WEST ▶

J. H. Watson Co., Inc., Bradley, Ill., manufacturer of sheet metal products, plans one-story addition. Cost close to \$50,000 with equipment.

Wilson & Co., Union Stock Yards, Chicago, meat packer, plans early rebuilding of part of branch packing plant at Cedar Rapids, Iowa, recently destroyed by fire. Loss about \$60,000 with equipment.

Water, Light, Power and Building Commission, Hibbing, Minn., J. P. Murphy, secretary, will soon take bids for boiler units with accessories, lime-soda water treating machinery and other equipment for municipal electric light and power plant. Burlingame & Hitchcock, Sexton Building, Minneapolis, are consulting engineers.

Supervising Construction Engineer, United States Indian Service, Billings, Mont., asks bids until March 10 for one concrete mixer, one diaphragm-type force pump, wheelbarrows, etc.; until March 19, Diesel engine-generating equipment and accessories.

Common Council, Rock Rapids, Iowa, has called special election to vote bonds for \$100,000 for new electric power plant and distribution lines. Cost about \$200,000, remainder of fund to be secured through Federal aid. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

Kenyon Farmers Mercantile & Elevator Co., Kenyon, Minn., has authorized two-story addition, 55 x 78 ft., at grain elevator, for machine and operating division. Cost over \$35,000 with machinery.

Iten-Barmettler Co., Omaha National Bank Building, Omaha, Neb., manufacturer of food products, has let general contract to Parsons Construction Co., 701 North

Twentieth Street, for new one and one-half story and basement plant at Thirtieth and Taylor Streets. Cost about \$150,000 with ovens, mixers, loaders, conveyors and other equipment. James T. Allan, Brandeis Theater Building, is architect.

Des Moines Railway Co., 114 Eleventh Street, Des Moines, Iowa, plans repair and service shop in connection with new car barns at East Des Moines. Cost close to \$45,000 with equipment.

◀ SOUTH CENTRAL ▶

United States Engineer Office, Memphis, Tenn., asks bids until March 9 for one horizontal, general service, direct-acting, duplex steam pump (Circular 215).

Cummins Distillery Co., New Haven, Ky., plans multi-story addition to distillery in Knob Creek district, primarily for storage and distribution. Cost over \$60,000 with equipment.

Shoreline Refining Co., Shreveport, La., plans extensions and improvements in oil refinery at Lewis, near Shreveport, for gasoline refining and other service. Cost close to \$200,000 with machinery.

Tennessee Valley Authority, Knoxville, Tenn., plans extensions in transmission lines for power supply to different communities in Hardin, Chester and McNairy counties, about 75 miles, including distributing lines, power substation and service facilities. Cost close to \$100,000. E. R. Wall is project engineer in charge.

Engineering Commission, City Hall, Birmingham, Col. A. C. Polk, executive engineer in charge, recently appointed by City Council for municipal industrial water supply project, will soon take bids for different parts of work, to include pumping machinery and accessories, tanks, pipe lines, etc. Fund of \$6,000,000 has been arranged through Federal aid. Sanborn & Bogert, 30 Church Street, New York, are consulting engineers.

United States Engineer Office, Vicksburg, Miss., asks bids until March 23 for angle and globe valves (Circular 197), one crawler-type tractor (Circular 199).

◀ PACIFIC COAST ▶

Hedgeside Distillery Co., Napa, Cal., plans new distillery on local site, with storage and distributing buildings and other units. Cost close to \$100,000 with equipment. Pierre de LaMontanya is president in charge.

Board of Education, 1151 South Broadway, Los Angeles, will soon take bids for new one-story vocational training shop at McKinley junior high school, East Forty-fifth Street. David J. Witmer and Loyall F. Watson, Architects' Building, are architects; Ralph E. Phillips, last noted address, is mechanical engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until

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March 10 for one printing press and one power-operated paper cutter for San Diego Navy Yard (Schedule 7257); one hydraulic tester (Schedule 7291); until March 17, 9672 galvanized screw anchor shackles (Schedule 7325) for Mare Island yard; galvanized iron or steel boat chains (Schedule 299), one motor-driven pedestal-type grinder (Schedule 7311) for Puget Sound yard; 11,030 pressure lubricating gun fittings for Mare Island and Puget Sound yards (Schedule 7318).

Western Gear Works, Inc., 417 Ninth Avenue South, Seattle, has awarded general contract to J. T. Shatto, Ambassador Hotel, for one-story addition, 56 x 145 ft. Cost about \$40,000 with equipment.

Muscate Co-operative Winery, Kingsburg, Cal., plans addition to increase present capacity about 50 per cent. Several new units will be built, with additional storage and distribution facilities. Cost about \$75,000 with equipment. Samuel F. Hollins is secretary.

Hemphill Diesel Engineering School, 2121 San Fernando Road, Los Angeles, has let general contract to Myers Brothers, 3407 San Fernando Road, for two one-story additions, 45 x 90 ft. and 38 x 96 ft. Cost close to \$40,000 with equipment. Norstrom & Anderson, Insurance Exchange Building, are architects.

◀ FOREIGN ▶

Ault & Wiborg, Ltd., London, England, manufacturer of printing inks, has plans for addition to local plant. Cost over \$400,000 with equipment. Gunton & Gunton, London, are architects. Company is affiliated with Ault & Wiborg Corp., Cincinnati.

Bloch Brothers, Ltd., Glasgow, Scotland, whiskey distillers, has purchased Scaja Distillery, Kirkwall, Scotland, heretofore owned by Scaja Distilling Corp., Ltd. Plant has been idle for past five years and will be remodeled by new owner, with installation of new equipment. Cost over \$200,000 with machinery.

Municipal Council, Capetown, South Africa, plans early call for bids for new municipal electric light and power plant on Dock Road, for which bonds for \$9,250,000 have been voted. Project will include transmission and distributing lines, power substations and other structures. G. H. Swingle is city engineer.

Falconbridge Nickel Mines, Ltd., Toronto, Ont., Canada, plans extensions and improvements in plant and properties at Sudbury, Ont., including new equipment. Cost over \$85,000 with machinery.

The Mathews Conveyor Co., Ellwood City, Pa., has received the official "award of merit" issued by the Rice Leaders of the World Association "for high character and worthwhile achievement," and is now participating in the constructive work of that organization to rebuild American business by fostering more widespread adherence to highest standards of business conduct.

Worthington Pump & Machinery Corp., Harrison, N. J., has been awarded contract for six centrifugal pumping units of 12,000 hp. each for the Metropolitan Water District, Los Angeles. These six pumps totaling 72,000 hp. are identical, each for a capacity of 90,000 gal. per min. against a total head of 460 ft., the high mark in pump application for this service, and the largest award made.

Lafayette College to Celebrate Seventieth Anniversary of Engineering Education

LAFAYETTE COLLEGE, Easton, Pa., will celebrate on March 20 its seventieth anniversary of engineering. Prominent engineers from many fields of the profession are invited, and speakers of national importance will appear on various programs of the celebration.

Engineering was offered for the first time during the 1865-66 college term, when the Pardee scientific department was established following the receipt of a \$200,000 endowment, the gift of Ario Pardee of Hazleton, Pa. This embraced the Pardee scientific course, which granted the degrees of Bachelor of Science, with the option of engineering, chemistry and mining. "Engineering" at that time implied the civil engineering course. By the spring of 1871 this system was altered, and the degrees of Mining Engineer and Civil Engineer were awarded at that commencement.

According to the old records the first men to receive the engineering degrees were William S. Kent and Joseph E. Watkins, the degree of Civil Engineer; and Alexander Bryden, Norris Hunter Cone and William McMurtrie, the degrees of Mining Engineer. All were members of the class of 1871. The first two engineering professors were Dr. Henry S. Osborn, who occupied the chair of mining and metallurgy in 1866, and Prof. Henry F. Walling, who became occupant of the chair of civil engineering in 1867. Both were well known in educational and professional circles.

While the course in engineering was not established until 1866, the founders of Lafayette had in mind such a department as their charter, originally framed in 1824 and granted in 1826, specifically mentions that courses in "civil and military engineering," should be taught in the proposed college.

Electrical engineering came into the Lafayette curriculum in 1889 when Prof. James W. Moore, of the physics department, and Prof. Justus Silliman, of the department of mining engineering, agreed to offer a course in this subject without cost to the college.

The mechanical engineering department was established in 1910. The plans for the department were made possible by a gift from An-

drew Carnegie of a \$100,000 endowment. The present mechanical laboratory and shop was completed in 1912. Prof. Edwin O. Fitch was the first head of the department. During the World War, when Lafayette became an active military center, soldiers received valuable training in this new building.

Chemical engineering, the newest of the existing departments, was established in 1915 with the late Dr. Edward I. Hart as its head. This distinguished international figure in the world of chemistry had long been associated with the college as professor of chemistry, and director of the Gayley Laboratory.

FINANCIAL NOTES

American Steel Foundries, Chicago, reports for 1935 net profit of \$116,692, equivalent to \$2.11 a share on the 7 per cent preferred, compared with \$245,365, or \$4.34 in 1934.

Harbison-Walker Refractories Co. had net profit in 1935 of \$1,805,669, equal to \$1.18 a common share after preferred dividends. Net profit in 1934 was \$1,247,461, or 77c. a common share. The company entered 1936 with unfilled orders larger than those for any year since 1930.

Midland Steel Products Co., Cleveland, reports for 1935 net profit of \$1,634,326 after deductions, compared with 1934 profit of \$680,666. Earnings were the largest since 1929.

Lima Locomotive Works, Lima, Ohio, sustained 1935 net loss of \$538,707 after depreciation, Federal tax, etc., against net loss of \$490,826 in 1934.

National Acme Co., Cleveland, had net profit in 1935 of \$257,408, equivalent to 31c. a share, compared with \$140,329, or 28c. a share, in 1934.

Bridgeport Machine Co., Bridgeport, Conn., voted dividend of \$1.50 a share on account of accumulations on the 7 per cent preferred stock, payable March 30 to holders of record March 20.

St. Joseph Lead Co., New York, reports for 1935 net profit of \$486,199 after all deductions, compared with a net loss of \$812,534 for 1934. As explained to stockholders in the company's semi-annual report, the large divergence between the two years was mainly due to a change in the method of computing depletion. Prior to deductions for depletion, abandoned leases, obsolescence of the Doe Run mill, and income taxes, the company's consolidated income showed an increase of \$118,820 over the previous year.